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Densmore's Improved Boiler.

The engravings are views of a boiler which since its first introduction, five years ago, has given eminent satisfaction in its qualities for rapidly generating steam, keeping up a constant circulation of water, and economizing fuel. Over two hundred of them are now in use, in all parts of the country, for stationary and steamboat purposes. Its construction appears to be very favorable to perfect combustion, and the facts sustain this opinion.

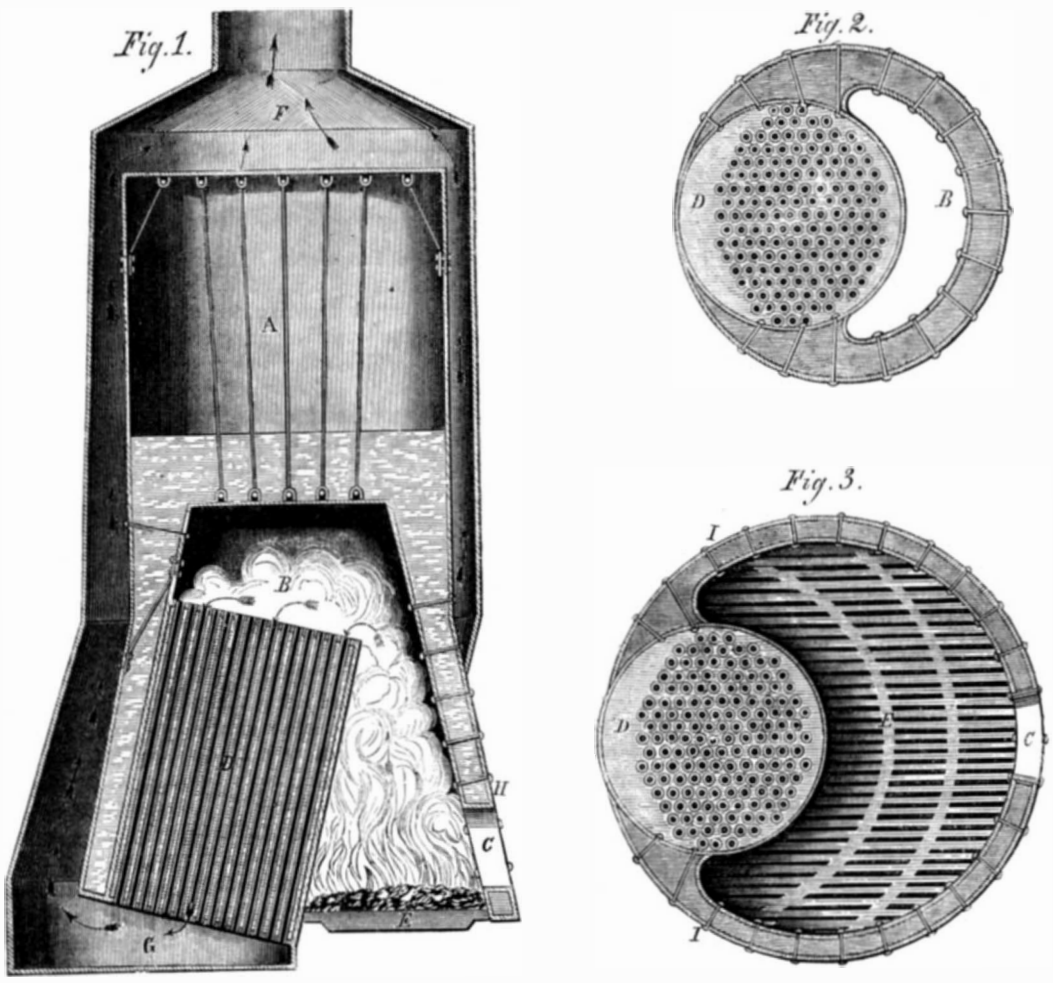
The lower portion of the boiler is in the form of a truncated cone and the remainder cylindrical. The fire box is of unusually large proportions, conforming to the shape of the lower part of the shell. A represents the shell of the boiler and B the fire box. In this box, on the side farthest from and opposite to the door, C, is a tube cylinder, D. This cylinder is inclined, conforming to the slant of the boiler, a small portion of its circumference forming the outer shell, as seen in Figs. 2 and 3. The lower front portion of this cylinder extends below the grate, E, and the heat of the fuel must impinge on the inclined front of the cylinder as it rises, thus securing a continuous circulation of the water. The arrows show the direction the gaseous products of combustion take. They rise to the space between the top of the cylinder and the crown sheets, then turn, passing down through the tubes —the interspaces between which are filled with water—to the bottom of the cylinder. From thence they rise in the space between the jacket, F, and the shell of the boiler to the smoke stack on the top. If the iron jacket is not used the smoke may escape through the space, G, directly to the chimney.

Fig. 2 is a transverse section across the boiler, taken on a line with the top of the front of the tube cylinder, and Fig. 3 is a similar section just over the grate. It will be seen that the area of the grate is of crescent shape, and that by the inclination of the tube cylinder and the sides of the fire box the space is gradually contracted to the top of the cylinder. This insures a very large grate surface and a correspondingly extended heating surface on the convex front of the tube cylinder, the concave sides of the fire box, and its top.

The steam room above the water line is ample so that only dry steam is delivered to the engine, and the boiler is not liable to foam. For burning bituminous coal this boiler is especially adapted. When built for this purpose the first row of stay bolts above the door at H are hollow, screwed through the outer and inner shell, and upset and riveted. These extend around from point to point marked I in Fig. 3. A strap having holes of corresponding diameter with those in the hollow stays and at the same distance apart, is secured to the outer surface of the boiler and held by lugs as guides, which permit it to slide by means of a lever to act as a damper, covering or uncovering the holes in the stay bolts as may be desired. When uncovered, atmospheric air rushes in in sufficient volume to add oxygen to insure the perfect combustion of the fuel. We have seen these boilers thus arranged and burning bituminous coal, and the smoke issuing from the stack was visible only as a steam-like vapor, having parted with its carbon, which in fine particles usually makes the unconsumed smoke from this kind of fuel so dense and black.

This boiler has more than double the amount of fire box surface to a foot of grate than ordinary boilers, and all of this surface is inclined toward the fire, so that the radiation of the heat is equal on every part of it. The inclined position of the tube cylinder and of the walls of the fire box, allows the steam, as it is formed against these surfaces, to leave them and flow upward against the outer shell, leaving the water solid against the fire plates preventing them from burning. The water is fed in around the bottom of the tubes and the strongest heat being at the upper portion of the tubes the cooler water is not lifted rapidly. This boiler is adapted to any kind of fuel which is used under other boilers. It is made of the best iron and thoroughly stayed in all its parts. It is built of different sizes from fifteen to three hundred horse power. No masonry is required in setting it, the boiler resting on legs.

Patented Sept. 15, 1863. For further particulars address Densmore & Black, patentees and manufacturers, 388 West 43d street, New York city.



DENSMORE'S UPRIGHT BOILER.

THE OFFICIAL CATALOGUE of the products of the United States exhibited at the Paris Exposition is a pamphlet of 172 pages, just published in French, German and English. Forty-three pages are devoted to a statistical and geographical review, compiled, if we may judge from the closing paragraph, by some enthusiastic and patriotic Yankee. The paragraph alluded to exhibits the celebrated truth that as our population was thirty-five and a half millions in 1865, so by the law of nature it must become equal to the population of the globe, in 1900.

DUDDERAR'S TREE PROTECTOR.

The "borer" is one of the worst pests against which the

fruit raiser has to contend. Its operations are comparatively secret, while the catterpillar works in broad daylight. The engraving represents a device calculated to prevent, rather than to remedy, the depredations of the borer. It is intended especially for peach trees, although adapted to other fruit trees.

It is a cylinder of sheet metal pierced with minute holes for the admission of air. It can be opened and placed around the trunk of a tree and secured by a rod passing through ears which project through holes in the outside lap of the cylinder. The cylinder is sunk a few inches in the earth and held by the soil being pressed around it and over the feet or legs secured to it At the top is attached a piece of oiled cloth or painted canvas the top of which is held closely around the trunk by a string. The longitudinal seam is then sewed up or secured by a cord run in, so that all is kept tight below that point. A patent for this device was obtained Jan. 16, 1867, by George W. Dudderar of Unionville, Md., whom address at that place for any additional information desired.

Telegraphs in Europe.

The Swiss telegraph, of which there are 1,130 miles of line, or fourteen miles for every hundred square miles of territory—has been for some years in the hands of the Government. The charge is uniformly one franc, and a quarter franc for every additional ten words, with free delivery by carrier within three miles, or by mail at greater distances. Postal money orders are also transmitted in the same way. The number of telegrams in 1865 was 364,000, and the proportion of telegrams to letters steadily increases. As the lightning travels up and down and through the snows with equal facility, it has a peculiar advantage over the mails in a country like Switzerland.

In Belgium, the telegraph is still cheaper, the uniform charge being only half a franc, or less than one dime for the first twenty words. The system has belonged to the Government since 1850, and every post office is either a telegraph office or an office for forwarding telegrams by messenger or mail as may be desired. There are 2,000 miles of line. Messages are written on stamped paper, and delivered free of further charge for a distance of a mile and a quarter, beyond which they may be forwarded express or free by mail. If the message does not reach its destination as soon as the mail, or is incorrectly sent, the price is returned. In 1860, at a charge of a franc and a half, there were 80,000 telegrams, being one to 218 letters; in 1865, at one franc, there were 332,700, being one to 48 letters. In December, 1865, the charge was reduced to half a franc, the present rate and the cheapest in the world.

In Prussia, the lowest charge by the national telegraph is about 15 cents. In Paris the postal telegraph system has been tried with success, with a uniform charge of half a franc; the number of dispatches having increased tenfold within six months after the reduction from one franc to the present rate.

Microscopic.

Mr. Dancer has executed a very curious and certainly minute sort of inquiry into the composition of furnace dust, *i. e.*, the extremely fine powder which accumulates in flues from the burning of coal, apart from sooty or carbonaceous accumulations. He washed the dust carefully, to separate the purely mineral ingredients, and by placing it on a slightly inclined glass, made the spherical particles to separate themselves from those of irregular shape, by rolling down the incline. These, examined under the microscope, were found to be quite interesting objects. Many of them appear to be perfectly spherical though less than $\frac{1}{100}$ of an inch in diameter, solid or hollow, with a brilliant polish, and in beautiful variety, crystalline, white, yellow, brown, black, agate or carnelian of various shades, and some like rusty cannon balls. Mr. Dancer supposes that these are mostly silicates, or various kinds of glass, colored, when not transparent, with different oxides, carbon, etc. He accounts for their shape by supposing that they have been thrown off in scintillations, of course in a molten state, in which by a law of matter they assume a spheroidal form. Many of them appear to be ferrous oxides or "iron ore," probably formed by the action of heat on the iron pyrites in the coal, and afterwards, in many cases, found to have been reduced to metallic iron and encased with an enamel of silicate. Hence the proportion of iron in the coal dust is much greater than is revealed by the analysis of coal ashes.

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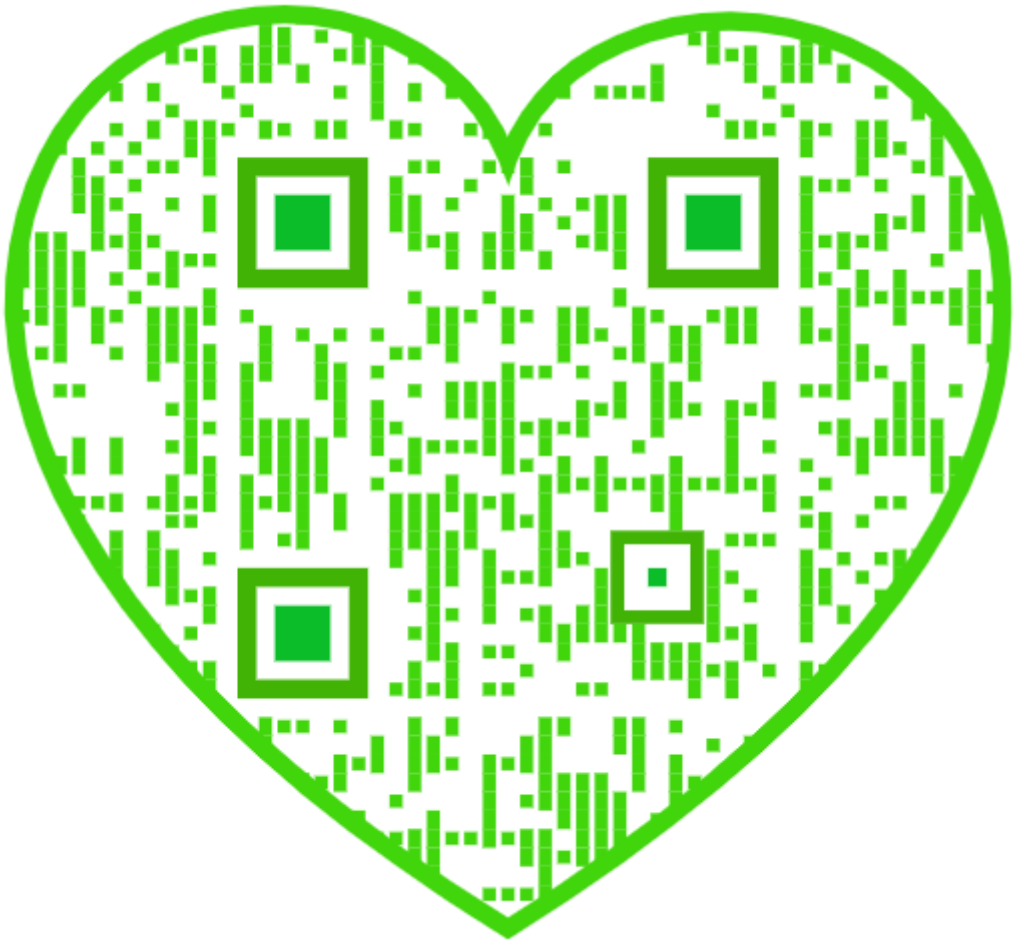

MANAGEMENT OF STEEL.

We have given considerable room to communications on this subject, but as it is one which is not surpassed in importance by any other process in the mechanic arts, it is proper that the suggestions and experience of practical men should be laid before our readers whenever they contain any new facts or support disputed theories. Below are extracts from three communications, each of them from practical steel workers. The first is from "C. H.," of Collinsville, Conn. He says:—

I have read with pleasure the articles on working and tempering steel in Nos. 7, 12, 15, and 16, current volume, and while agreeing with many of the statements of your correspondents, there are others to which I should take exceptions. In the one by "E. M. F.," in No. 16, he says: "We can neither depend upon the degree of polish nor color of surface. The secret lies in the working of the steel and in the proper degree of heat given the steel to be hardened." This is true in a certain sense, and yet when the steel has been properly worked, and hardened at a proper heat, some guide is needed in bringing it to the right temper, and I know of none so sure as the color. But all tools do not require the same degree of hardness. Take for instance, a bar of steel of the proper quality for wood-cutting tools, and make from it an ax, framing chisel, carpenter's hatchet, drawing knife, and turning chisel. Work it carefully, harden in brine as strong as salt will make it, at the lowest heat that will thoroughly harden it through, wash off the salt in fresh water, scour with a piece of common grindstone, just sufficiently to remove the scale, and draw the temper of the turning chisel to a light straw, merely changing the color; drawing knife, a bright copper; carpenter's hatchet, copper with purple spots; framing chisel, purple; chopping ax, deep blue; and we shall have tools that will stand any reasonable amount of strain, and carry at the same time a keen, smooth edge. Of course if a higher or lower grade of steel is used it will be necessary to vary somewhat from this.

One cause of trouble among the workers of steel is that they do not get steel adapted to the different kinds of tools they make. To illustrate this point, some years since I was making cast-steel hoes. I wanted a pair of blades for trimming shears, and having nothing else of the right size at hand, I made them from a bar of hoe steel, leaving them at the usual temper. But although the steel was of the very best quality of its grade, they would not stand; the edges would roll. I hardened them again, leaving them much higher. Then they would crumble and after several ineffectual attempts to make them cut I gave it up as a bad job, and made a pair from steel adapted to that kind of work, and afterward had no trouble. From my experience of more than thirty years, I am convinced that three things are absolutely needed to make good tools: 1st, steel of a grade adapted to the required tool; 2nd, a proper working of the steel in making, not heating too hot nor hammering too cold; 3d, proper hardening and tempering. Now if any man expects to succeed in the business and make a uniformly good tool without proper attention to each of the points named, I think he is doomed to disappointment.

"R. F. S.," also of Collinsville, the seat of an immense manufacture of axes, scythes, etc., gives some opinions on color and heating. He says:

E. M. F. has a good article in No. 16, but thinks steel should only be heated to a dark cherry red to harden. Now this is too indefinite, as cherries differ materially in color. Eyes also differ in judging of color. A cherry-red heat on a forge under the window and one on a forge in a shady place are two very different heats. Again the heat required by high and low steel cannot be governed by the color of the same cherry, nor can a piece of steel one-eighth of an inch thick be properly hardened with the heat required by a piece one-half of an inch in thickness. I am of the opinion that the only proper test as to the amount of heat required is to be had by experiment. Now we find that the most approved brands of steel are nearly uniform in themselves; then we are safe in taking a piece and find the lowest point of heat at which it will receive a thorough hardening and the experienced eye must follow the lead thus indicated, often applying the test to keep the eye right. In the article of "W. S. D.," in May 11th, he speaks of tempering by one process, or of giving steel just the desired hardness without the necessity of drawing the temper, but thinks it is a matter of such nicety as to be impracticable. I differ somewhat from him.

Assuming that a piece of good steel has been properly forged and the desired refinement given it by a judicious hammering, my experience is that the steel receives an additional refinement by a thorough hardening, and in proportion as it lacks in being made as hard as it can be by the hardening process, just so much it is lacking in its perfect refinement; and when I speak of steel being made as hard as it can be I repudiate the idea that an extra high heat will produce an extra hardness; a high heat may produce an extra brittleness which some mistake for hardness, but the fact is such brittle steel will file easier than if hardened at just the proper heat.

"H. G.," of Mansfield, Ohio, gives some practical hints drawn from an experience of twenty years. He says:

In ordering my steel I always state the use for which it is intended, as all know that much depends upon the quality of the material, and we cannot make a fine tool from a coarse steel. Steel should never be heated above a degree sufficient to work it into the required shape; at the same time it should never be hammered when lower than a cherry as it becomes hard and brittle, and in most cases will check or become flawy. When hardened, steel should be worked in a good clean fire (charcoal fire is the best) and should be hammered sufficiently to thoroughly work the steel, but should never be drawn from a large bar to a small one, as it will invariably crack or spring in hardening; it should be hammered as smooth as possible, especially when it is to be hardened without finishing, as a smooth piece of steel is less liable to crack in hardening than one that may be full of hammer marks or scales. When heated to harden, heat very slowly and just sufficiently to take the temper, and when plunged into the water under no circumstances should it be withdrawn until cool, or not one degree above the water in which it is plunged, as it will crack and fly then if ever, and there are several instances where people have lost the use of an eye by withdrawing steel from the water before it was thoroughly cool. After the steel has been hardened it should be polished even and fine, always in one direction, and be drawn as slowly as possible, and for the finer qualities of work should never be cooled while drawing, but should be drawn gradually enough to lay it down and let it cool off without checking, as it will make it tougher, and not so liable to crack. Many smiths use tallow to bring out the color, but the utility of this I very much doubt except in some few cases where the work is very small and difficult to polish. I think, owing to the difference in steel and the nature of the work for which the tool is intended, that the exact color cannot be laid down with any degree of accuracy and is only to be ascertained by experience and careful study of the nature of the steel and the work to be performed, as the lower the steel the higher temper it will bear with safety and *vice versa*. After all my experience I have come to the conclusion that it is an impossibility to make a good cutting tool without polishing the steel to draw the temper.

BOILER FEED PIPES, CHECK VALVES, AND CAST-IRON HEADS.

From a correspondent, G. W. D., of Providence, R. I., we have received some account of a boiler explosion which lately took place in Massachusetts. One of the boilers in a nest of eight, burst, displacing the remaining seven and carrying destruction in the path of its fragments. The boiler was rent in two parts, one part imbedding itself in the chimney and the other flying two hundred feet, cutting through a telegraph pole, damaging a railroad embankment, tearing up the rails and plowing a furrow in the ground, after striking, two feet deep and two hundred feet long. The superintendent of the works attributed the explosion to excess of water in the boiler, but our correspondent thinks it was occasioned rather by absence of water.

The nest of boilers was fed with water by a common pipe, having branches leading to each boiler, and one check valve on the main pipe between the pump and nearest boiler. Our correspondent believes that unequal firing disturbed the equilibrium of the water; in other words that firing under one boiler more than under another will create a greater pressure of steam in that boiler, forcing the water out into the cooler boilers, thus leaving the boiler which bears the most intense heat without an adequate supply of water.

He approves of introducing a check valve to every boiler to prevent the water from being driven out of one boiler into another, and, better than that, to employ competent men to manage boilers in sets.

It seems as though there could be only one place to which the check valves could be applied, and that would be in the branch pipes leading from the main feed pipe to each boiler. If placed in the main horizontal pipe they would prevent the water from backing into one boiler, but not into that on the other side. If the water-feed pipes are large enough and the connection between the steam spaces ample, it seems there should be but little trouble in equalizing the pressure and the level of water in the different boilers without any check valves. Preferably, independent feed pipes to each boiler should be employed; then each boiler could be treated as a separate generator. If not, would it not be well to introduce cocks between the boilers to be attended to by the fireman or engineer? Sometimes one or two boilers of a nest are used while the others remain idle. In this case there is a means to stop both water and steam communication between those in use and those at rest. Under such circumstances the equilibrium must depend upon the knowledge, carefulness, and attention of the fireman, or the constant oversight of the engineer.

A similar explosion to that mentioned by G. W. D. is described by a correspondent from Jacksonville, Fla. In this case the boiler that exploded was the middle one of three plain, cylindrical boilers, forty feet long and forty inches diameter. The cast-iron head blew out, the disk cut from the flange as evenly as though turned off in a lathe. The head itself merely blew out and lodged at the foot of the chimney directly behind the boiler, while the shell went at least three hundred feet, cutting timbers off clean and dragging its two companions from their beds about their own length. The writer attributes the blowing out of the cast-iron head to its vibration by alternate expansion and contraction, or bulging by being heated during the day and cooled during the night. This is undoubtedly the reason why it gave way as it did, but why should that particular boiler head yield and not either of the others? More internal pressure was exerted on this boiler than on the others or all would have gone and at the same time. Our informant does not describe the means of communication or of separation between the boilers, but only says "there was abundant means of communication both for water and steam between all these boilers, and no greater pressure could exist in one boiler than in the others." The explosion took place in the morning before the machinery had been put in operation. The watchman states that there was plenty of water and the steam gage stood at seventy pounds. The engineer says he left the boilers the night before with three gages of water, and our correspondent deemed the sound of the whistle which he heard a few minutes before the explosion not to indicate a high pressure of steam. All this may be and yet there may be circumstances in regard to the communication between the boilers which are not mentioned by our correspondent which would, in a measure at least, afford a probable reason for the explosion. We knew a case where a boiler in a set was exploded when ample means of communication existed, but the steam and water connections could be closed by cocks. Notwithstanding the asserverations of the fireman, it was evident that the exploded boiler was without a proper supply of water. If the steam communication was closed and the water communication open between the different boilers, and one boiler was fired harder than another, it would not require a very great preponderance of steam pressure to empty the water from the heated boiler into the others, leaving that one in a most dangerous condition.

As to making cast-iron heads thick enough to prevent springing, it may be questionable whether this would be as effectual and economical a remedy as making them of wrought iron and of hemispherical form as is the practice in England. This is a far better form to resisti nternal pressure than the flat disk head. In flue boilers the flues themselves are usually the only stays employed in retaining the heads in position, but the expansion of the flues is sufficient to exert an enormous force on the heads. It is no wonder that explosions occur from this cause; the wonder is that they are not more frequent.

The Repeating and Breech-loading Rifle.

Captain Majendie, an assistant superintendent prominently employed in the trials of arms and ammunition in England, lately delivered a lecture before the Royal Institution, in which he reviewed the progress of breech-loading rifles, concluding with the decided opinion that the final solution of the problem would not be reached until the magazine or repeating rifle should be so simplified and perfected as to meet all exigencies of service, at the same time as a single loader while carrying its magazine complement ready in reserve. The alteration of the Spencer repeating rifle to meet this requirement was the subject of an interesting trial on the 26th of April, at Vincennes, France, where it is reported to have elicited the warmest approbation from the French military authorities, none of whom were previously well disposed toward it. In fact, says the *Mechanics' Magazine*, the only draw back to this arm for general military purposes, has been that it could only be used as a repeater, and now that it can be used thus or as a direct breech-loader, at will, the French authorities are convinced of the efficiency of the rifle every way: the remarkable accuracy and unparellelled rapidity of fire—21 shots a minute—having extorted unqualified admiration.

Very interesting characteristics of warfare with the Indians, as modified by this weapon in the hands of our troops, are recalled from the testimony of Lieut. McMurray, of the 1st artillery. One day in the fall of 1865, two mountain men and nine soldiers, armed with this rifle, fought their way steadily on foot through an encircling force of not less than 1200 to 1500 Sioux and Cheyennes. The moral effect of the constant fire from so few arms, and its accuracy at long range, kept the Indians out of arrow range as effectually as the dreaded "shooting wagons" of the artillery, and the party regained the command without a wounded man. On another occasion two men out hunting were pursued by twenty or twenty-five Indians: one of them was killed, but the other took shelter in a little gulch and commenced pouring in his fire from the magazine rifle, and after killing and wounding four Indians and two horses, the rest galloped away, when he pursued his way to the command unmolested. The Indian bow is more deadly within range than any non-repeating rifle, as they can handle their arrows rapidly enough to keep from five to seven in the air following one another at once, with an almost unerring aim. But the Spencer rifle is too much for the bow, from its equal rapidity and longer range; and too much for the archer likewise, as yet, for the Indians have been seen to pick up the rifles of men they had killed, load them by the muzzles, and after many ineffectual attempts to fire them, throw them away.

The Cere Viaduct.

This fine structure, crossing the valley of the Cere and carrying the Paris and Orleans railway at a hight of 181½ feet from the water, is another and more complex and lofty specimen of the modern style of bridges supported on tubular piers. Each of these consists of eight cast iron columns, grouped in an ellipse, united by cross bracing, and resting on a base of brickwork. The piers taper upward from a base of about 8x16 feet, at the rate of 1 in 30 toward the major axis and 1 in 15 toward the minor axis of the ellipse. Their hights, we are unable to state precisely, but the highest cannot be far from 150 feet. There are five spans of lattice girders, the three central spans being 164 feet each, and the end spans 145 and 139. The abutments are of stone. The erection of this viaduct was conducted in the same bold manner as that adopted at Fribourg, the girders being first put together on the abutments, and then pushed forward until the overhanging ends were over the brickwork base of the first of the iron piers to be erected. They were then braced, and used as the jib of a crane for hoisting into place the successive joints of the tall iron limbs upon which they were to rest. When one of the piers was thus completed, the girders were again pushed forward until the foremost end rested on it and projected forward over the base of the second pier, and the same process as before was repeated until the structure was complete. The total cost was about $150,000.

IODIDE OF SILVER possesses the singular property of contracting by heat and expanding by its withdrawal.

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Editorial Summary.

A SUBTERRANEAN WATER SPOUT.—A remarkable irruption of water took place recently in the Cole silver mine, Virginia city, Nevada. The tunnel is a little over 1600 feet in length and perfectly straight. Several successive outbursts of water have rushed through the tunnel, the last filling it up with rock for a distance of nearly 100 feet. At the last accounts, this had been cleared out by the workmen except about ten feet, and but little loose rock was then coming in; although a large stream of water, about thirty-five inches, was still rushing over and through the pile of loose rock obstructing the tunnel, with a loud roar, occasionally accumulating its force and thrusting the mass partially forward. A large cavern must have been formed at the head of the tunnel, as hundreds of tuns of rock have come from it; but it has not yet been explored. A curious effect is noticed from throwing in the daylight to the head of this straight tunnel by means of a properly placed mirror at the mouth. Persons at the further end are plainly distinguishable and whether dressed in black, blue or any other color, appear as white as snow—a ghostly sight.

MODERN GEMS.—The progress of human skill in the imitation of precious stones, and the gradual giving-out of the diamond mines of Golconda and India, have rendered spurious gems more abundant and more perfect in imitation than ever. Even expert connoisseurs are said to be sometimes deceived by certain classes of imitation gems; and so far as this is the case, the advantage of the genuine stones over the spurious in a merely ornamental point of view, has certainly been reduced to a very fine shade. A recent work on the subject states that but a small proportion of the gems now sold and worn are genuine, and that large quantities are made in Birmingham and Paris, sent to India, and sold by the natives to strangers as "gems from the mine." The steady progress of science in the re-composition of natural products leaves little room to doubt that man will eventually conquer this field also from nature and occupy it with more exquisite products of art.

SILVER MICA.—Puscher, of Nurnberg, has adapted mica very beautifully for decorative work, such as inlaying and metal-coloring. After purifying it by treating in thin sheets with a strong solution of sulphuric acid, it is silvered exactly like a looking glass, and appears like a most brilliant film of metal. The ease with which it is cut in shapes and laid superficially, together with the splendor of its appearance, may be imagined. For a dead silver white, it is heated to redness in a clay muffle—after cutting into the shapes required—when it loses most of its flexibility, and becomes white, but in single sheets remains partially transparent and flecked with gray spots. The latter, with the transparency, disappear when two or three pieces are laid together. Small fragments of it, or finely ground, may be sprinkled upon a freshly poured sheet or coating of gelatine, and then fixed by a varnish, with beautiful effect.

VELOCITY OF STEAM AND OTHER GASES.—Mr. R. D. Napier has demonstrated to his own satisfaction and that of others first theoretically and afterward by experiment, that the velocity at which steam will flow from a boiler through an orifice into a vacuum, is rather less than half of that given in all published tables, and that it is no greater into a perfect or partial vacuum (at a pressure of two or more atmospheres) than into the air. The general law is established, that a gas of any given pressure will rush into a gas of not more than half that pressure, at the same rate as into a vacuum.

BERNABE'S IRON COPPERING.—Admiral Viscount de Chabannes, at Toulon, writes in a published letter that not only is the adhesion of the iron and copper by M. Bernabe's process as employed in the arsenal of Toulon, so perfect that they are not started apart by hammering, bending or breaking, but that if a hole in the copper at any time occurs from abrasion, the part can be re-coppered on the spot, as effectively as before. If this means that a repair of this kind can be effected on a ship's bottom, the method may very well have all the value attributed to it.

THE HYDRAULIC PROPELLER.—We observe that Admiral Elliott, in a paper read before the Institution of Naval Architects, has come out very strongly in favor of the "Water-witch" principle as the future motive power for ships of war. He was as strongly sustained in the ensuing discussion by Sir Edward Belcher, and warmly encouraged by Mr. Scott Russell while Mr. Reed, Chief Constructor of the Navy, and others, opposed. Mr. Russell predicted that with time and perseverance the plan would certainly succeed in the end, and supersede the screw for the purposes of warfare.

THE IMPROVEMENT OF THE RHONE is prosecuted vigorously by the French Government. At nine points the river has been or is now being straightened, widened or deepened, as the case required, so as render navigation safe and unimpeded. All efforts to improve the natural channel at the mouth having failed, a canal two miles long has been cut for an outlet to the sea; issuing from the river by a lock 500 feet long and 70 feet wide, and discharging into an open dock formed by two piers, each three quarters of a mile long.

MISCELLANEOUS.—Iron at an intense red heat is transparent to a slight depth.——The British Government have awarded Major Palliser $50,000 for his improvement in projectiles and propose to ask half as much more for him in their next year's estimates.

INGENIOUS LIGHT DRAFT STEAMERS.—A late paper by J. R. Napier explains the construction of some steam tugs and barges now building at Glasgow for the Godavery river (India) of a length of some 140 feet by 25 feet wide, and only one foot draft. The bottoms are made of galvanized cast steel plates only one eighth of an inch thick, fastened to longitudinal frames two feet apart. To stiffen a hull so long, light and shallow, the awning necessary under the tropical sun and rains, is made of galvanized one sixteenth inch steel plates, on frames similar to the bottom, but lighter and closer, and is made virtually a part of the hull, being connected with the vessel's bottom by two steel lattice frames placed about two thirds of the width of the vessel apart, and the whole structure is stiffened laterally by steel angle bars and diagonal braces. The propeller being at the stern, the boiler and fuel are placed in the forepart of the vessel to balance it. The engines consist of a pair of 11 inch cylinders with 4 feet stroke, supplied with steam at 150 lbs. pressure by a boiler nearly like that of a locomotive. The paddle arms are of wood, of a radius of 3½ feet, and have no rims or floats. Except a short forward deck for a steam capstan, warping pulleys and anchors for getting off sand banks, they are open boats, with a light floor of wood laid on the bottom frames. With 2½ feet of freeboard and 1 foot draft, their depth will be about 3½ feet.

CONCERNING SOUND.—The transmission of sound through solid metallic tubes is so perfect that conversation has been maintained in a low tone between the ends of one of the Paris water pipes 3,120 feet long. The velocity of the transmission of sound is greater, by four to sixteen times, in metals than in air, and in wood, as computed by Chladni, from ten to sixteen times greater; which is not so commonly known. Rock conveys sound so much faster than air that the ear applied to a stratum of rock in which blasting is being done at a distance, will perceive two distinct reports; that conveyed through the rock first, and afterward the ordinary report through the atmosphere. It has been found that the velocity is also proportioned to the loudness of the report, other things being equal. With 2,000 pounds of powder a report travelled 967 feet in a second; with 12,000 pounds, 1,210. The most notable observation lately made in the direction of reducing sound to form and measure, is the refraction of it by M. Sondhaus, by means of accoustic lenses made of spherical collodion envelopes filled with carbonic acid

THE BOXER SHRAPNEL SHELL.—Shrapnel is a spherical shell filled with powder and bullets. In the old kind the powder and bullets are mingled: the improved segment shell adopted in 1859, separates them, obviating the tendency to burst in or near the gun from the mutual collision of the contents on beng discharged. The Boxer scrapnel is a cylindrical iron case with the powder in a chamber at its base, where the walls are thick, and some 450 iron bullets in the forward part; thus resembling substantially a loaded cannon in itself. A trial was made at Shoeburyness, April 26th, to test the comparative effects of the improved shrapnel of 1859 and Colonel Boxer's invention. Three targets were placed one behind another, that in front presenting a surface of 9x54 feet. The Boxer, fired from a 9-inch gun with 30 lbs of powder, sent 142 balls through the front target, 46 of these through and 60 into the second target, and 26 of the latter through and 6 into the third target.

GUN COTTON has now taken a well-defined place in commerce and utility, and its manufacture has been so far perfected that its definite quality is as certain a result as that of gunpowder, its liability to spontaneous explosion has been obviated and, the rapidity of its combustion can be accurately regulated, It owes its present position to the combined exertions of three parties: Major Von Lenk, of the Austrian army, Mr. Abel, of Woolwich, Eng., and Messrs. Prentice, of Stow Market. The spontaneous chemical changes which have led to disastrous explosions, are characteristic of lower compounds, a very small percentage of which is liable to form under certain conditions in the tri-nitro-cellulose which constitutes the most perfect form of gun cotton. This is now prevented by Mr. Abel, by adding a little carbonate of soda which neutralizes the first result of change, consisting of a little nitrous acid; and all further decomposition is thus obviated.

DAW'S METALLIC CARTRIDGE—specially designed for breech-loading rifles—is cased in thin rolled brass, formed around a mandrel with two turns, the end cemented down, the base united with a metallic cover, and the whole made completely impervious to water. This cartridge is extolled in the English journals as the best, surest, cleanest, lightest and cheapest yet made.

A WELL-VENTILATED MEASURE.—The English journals inform us that on the night the reform bill was introduced, 1,500,000 cubic feet of air, comfortably warmed, passed through the House of Commons every hour. Fifteen miles of steam pipes are used in warming the two Houses.

BUSINESS AND MANUFACTURING ITEMS.

COTTON.—A French stocking machine now on exhibition is made to notify its attendant of the breaking of a thread by a very simple arrangement; each thread sustaining a small steel lever which drops when the thread is broken, so as to complete an electrical circuit and cause the striking of a bell.

IRON.—The reported failure of the Paris Bessemer steel bridge is denied emphatically. The apparent deflection of the center (which is a straight line) was an optical illusion.——Mr. J. Campbell Evans, of the Morden Iron Works, East Greenwich, Eng., has made a machine which rolls screws by means of three circular dies, set with the proper pitch, in such a manner as to rotate the red-hot bolt between them and shape the thread by their edges.

MINING.—The cost of English coal in human life in five years was, from 1856 to 1860, 5,089 lives for 381,000,000 tuns; from 1861 to 1865, 4,627 lives for 468,500,000 tuns.——Iridium is said to be among the minerals found in connection with gold in the Richardson Mine at Madoc, C. W. It is also found at Chaudiére, together with platinum. It is a rare and valuable metal, of extreme hardness, and is in demand for pointing gold pens.——The falling off in the Australian gold fields has prompted the authorities of Queensland to stimulate new discovery by offering a reward of $15,000 for the discovery of any new gold field not less than 20 miles distant from any other already proclaimed within the colony.

RAILROADS.—It is proposed to consolidate the St. Louis and Iron Mountain Railroad, which runs southward from St. Louis through the great metalliferous region of southeast Missouri, with the Cairo and Fulton, which is designed to run from a junction with the former road to Cairo (30 miles from Cairo west having been heretofore completed), and thence to be extended southward to Belmont, opposite Columbus, Ky., which is the terminus of the Mobile and Ohio road. Some 100 miles of the line are yet to be built, though partly graded. St. Louis will thus get a direct connection with the whole southern system of railroads, and a route to New Orleans 700 miles long, or 500 miles shorter than by the river. So says the *Railroad Journal*.—Further particulars of Robertson's (Nevada) track-laying machine—pronounced in San Francisco a complete success—show the motory arrangements more clearly than we were enabled to obtain them from an imperfect newspaper report, a few weeks since. The leading necessity, a road for the machine that makes the road, is provided by placing the levelling, tie-laying and track-laying machinery forward of the trucks, on a projecting portion of the frame, forty feet long. The whole frame, 60 feet long, resembles the skeleton of a lattice bridge, and rests by its last 20 feet on low car trucks, over which are placed the engine and boiler, and the load of ties and rails. The latter are passed over the machinery as fast as wanted by endless chains and overhead travelling cranes, and laid as heretofore described, forming the track upon which the machine moves forward, while a tender train brings up the fresh materials without interruption of the work. It requires only 20 men, and lays track at the rate of six to twelve miles a day.—The Mont Cenis tunnel having passed through the quartz and entered upon a softer stratum, now proceeds much more rapidly. It is now more than half done, 4·129 miles having been tunnelled, leaving 3·461 miles yet to be bored.—The Russian Government is making surveys for great lines uniting the Baltic to the Black and Caspian Seas.—It is stated that a line of steamships is to be established between Hamburg and Aspinwall, commencing with monthly trips. Direct emigration to the Pacific coast as well as direct trade, from Germany, may probably be stimulated by such an enterprise.—A first-class carriage on the Great Northern Railway (Eng.) caught fire on the 26th of April last, when at full speed, and burned for fully ten minutes, until it became wrapped in flames, before the distressing situation of the passengers was discovered by the guard. Their signals, shouts and shrieks (a number were ladies) were of no avail whatever. Where were the rockets?

MISCELLANEOUS.—A commission appointed by the legislature of Maine is engaged in investigating the problem of restoring and preserving the fish, which have disappeared from the streams to a great extent in consequence of the erection of dams and manufacturing establishments.—Brown coal, or lignite, has been found in considerable beds in Middlesex county, New Jersey, between Keyport and South Amboy. The proximity of this coal to the city of New York, where it is calculated that it can be delivered at a cost of not over $2 a tun, will render the beds very valuable property, even if the coal is none of the best.—The Boston Fruit Preserving Company freeze fish solid in their establishment in a few minutes, and preserve them for an indefinite period. It is supposed that a large trade will be done in frozen and preserved fish. It is proposed to pack salmon in this way in the summer, when they are cheap, for winter sale.—A Los Angeles, Cal., olive-grower sold last year from seventy trees, occupying about 1½ acres of land, 2,800 gallons of oil for $1,400.—Coral for jewelry is said to have risen in value within five or six years from five dollars an ounce to one hundred; five or six times its weight in gold.—The *Caledonian Mercury*, established in 1662, and which claimed to be the oldest newspaper in Great Britain, on the 20th of April ceased to be published, after an existence of more than two centuries.—Coal is hereafter to be used exclusively as fuel on the New York and Erie Railroad, and the company have commenced selling off the wood they have on hand.—The New York City Railroads conveyed in 1866 nearly a hundred millions of passengers (93,907,682): an increase of over twelve millions from the previous year.—A shoal of from 150 to 200 bottle-nosed whales visited Musselburgh Bay, Scotland, on the 20th of April last, and were attacked by the Frith of Forth fishermen. After an exciting and protracted battle, witnessed by hundreds of spectators, 25 of the whales were brought ashore, measuring from 9 to 25½ feet in length.—A rich lode of bismuth has been discovered in South Australia, 200 miles in the interior. The product of the mine has commenced arriving in England.—The Franco-American Telegraph bill has been approved by the Governor of New York, and a certified copy has been dispatched to France where the Imperial Government, it is said, is ready to promote the enterprise in the most substantial way. The grantees are required to have the line in operation in two years; which is rather short notice.—It is said that a million of dollars is annually made by the sale of Florida cedar wood for lead pencils.

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Science Familiarly Illustrated.

What Is Petroleum?

The crude petroleum of Pennsylvania always issues up out of the earth mixed with inflammable gas. This gas makes an excellent fuel, and is much used for generating steam for the pumping engines. It is abundant enough to run all the engines in the oil district.

If the gas as it issues out of the wells be subjected to pressure or to a temporature of zero, a considerable percentage of it will be condensed into a liquid, the amount condensed being somewhat proportioned to the pressure and cold. Some of it, however, refuses to condense at any pressure and cold which we can command, and such is consequently a permanent gas. That which condenses assumes the form of gas again as soon as the pressure is removed and it is exposed to ordinary temperatures. The change into gas or vapor is very rapid and violent, and in fact is a case of boiling. Some of the volatile liquids will boil on ice!

It is evident from these statements that petroleum gas is in fact a mixture of several gases and vapors, which may be separated from each other by careful management of pressure and cold.

We may likewise demonstrate the fact that the liquid crude petroleum is a mixture of different liquids. The partial separation of these may readily be effected by distillation. The oil which first appears on distillation is very light in gravity and has a low boiling point. As the distillation progresses the gravity and boiling point increase with remarkable regularity; from the beginning to the end there appears to be a constant and regular progression.

The reader is now prepared to apprehend the fact that petroleum is composed of a *series* of substances having properties which differ from each other only in degree. There is a beginning and an end, or top and bottom of the series, and between them regular gradations of intermediates. The beginning or top of the series is a permanent gas; the bottom or end is a solid. Between these are gradations of consistency, gravity, and volatility.

In an arithmetical or geometrical series there is always a peculiar difference between consecutive members of the series: given one member of the series and that peculiar difference, and the whole series may be determined, or any particular member of it. Is there any such certain and interesting relation between the members of the petroleum series?

The only chemical elements which enter into petroleum are carbon (C) and hydrogen (H). (Water, sulphur, nitrogen, compounds, etc., which are often found in crude petroleum are properly regarded as foreign substances.) Now it is evident that the members of the series must differ by varying proportions of these elements—there must be progressive increase of one over the other.

The beginning of the series has been found to be composed of two atoms of carbon (C_2) with four atoms of hydrogen (H_4); the beginning of the series is represented thus—$C_2 H_4$. Now it happens that this substance $C_2 H_4$ to chemists is a familiar acquaintance. It is commonly known under the name of *marsh gas*, and is known to coal miners as fire damp. The second member of the series is $C_4 H_6$, and the third is $C_6 H_8$. The reader hardly needs to be told that the fourth is $C_8 H_{10}$, and he is able to determine the twentieth. The common difference of the series is $C_2 H_2$, and the general formula for the series is $C_n + H_{n+2}$.

We append a table showing the specific gravity and boiling point of a part of the series. The first four are gaseous at ordinary temperatures, and the specific gravities are given in comparison with air:—

		Specific gravity.	Boiling point.
1	$C_2 H_4$	0·554	..
2	$C_4 H_6$	1·04	..
3	$C_6 H_8$	1·52	..
4	$C_8 H_{10}$	2·01	32°
5	$C_{10} H_{12}$	·628	86°
6	$C_{12} H_{14}$	·669	158°
7	$C_{14} H_{16}$	·699	198°
8	$C_{16} H_{18}$	·726	243°
9	$C_{18} H_{20}$	·747	278°
10	$C_{20} H_{22}$	·757	321°
11	$C_{22} H_{24}$	·766	359°
12	$C_{24} H_{26}$	·766	408°
13	$C_{26} H_{28}$	·792	423°
14	$C_{28} H_{30}$	·800	460°
15	$C_{30} H_{32}$	..	496°
16	$C_{32} H_{34}$	..	527°
17	$C_{34} H_{36}$	·825	..
25	Paraffine	·870	..

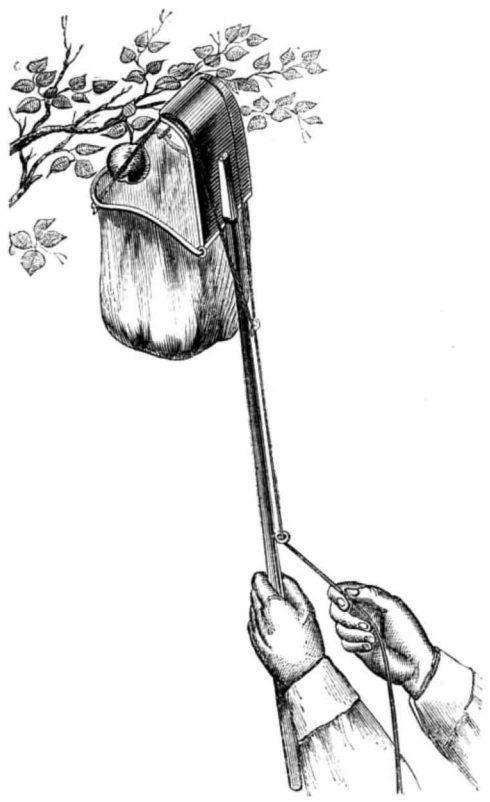
A National Survey.

The survey ordered by Congress, under the direction of the Secretary of War, of a belt of land extending from the Rocky Mountains to the Sierra Nevada, on the route of the Central Pacific Railroad, will probably be commenced by the first of July. The exploring party, to which we have already referred, headed by Mr. Clarence King, who has had several years experience as a mountain explorer, in connection with the State Geological Survey of California, has already started for the Pacific Coast. Among the nine assistants, as we learn from the *Nation*, are Mr. James T. Gardner, who has lately been engaged with Mr. King in surveying and mapping the Yo Semite Valley and the adjacent mountain region, as first assistant in topography, and Professor James D. Hague of the Massachusetts Institute of Technology, likewise an experienced traveler, as first assistant in geology. There are also two other topographers, two other geologists, and a zoologist, a botanist and a photographer. On their arrival in California, a squad of twenty-three mounted Californians, under non-commissioned officers, will be detailed as a military escort, and with six drivers and packers will make up a party of thirty-nine.

The proposed line of exploration extends about 1,000 miles, by 100 broad, from Pyramid Lake, near Virginia City, on the eastern slope of the Sierra Nevada, to Denver City, on the eastern slope of the Rocky Mountains. The party hope to go this year, as far as Fort Riley, and spend the winter in the neighborhood of Virginia City. Next year they hope to reach Salt Lake City, and their work out of doors is to be completed in the third year.

BROWN'S FRUIT GATHERER.

In picking fruit trees the danger of climbing and of ascending ladders detracts much from the pleasure. To be sure "when the pear is ripe it will fall into our hands," if our hands are in the proper position. But in the engraving is shown a very simple fruit gatherer by which one may stand on *terra firma* and exploiter the denizens of the orchard. It is merely a bag for the reception of the fruit secured to a pivoted frame of wire, which when the cord is pulled, closes against the edge of a curved plate. The operator holds the staff to which the apparatus is fixed, in one hand and pulls the cord which operates it, with the other



Placing the aperture so as to envelop the fruit, he merely pulls the cord, when the fruit is separated from the branch and drops in the bag. For the picking of fruit designed to keep, much care is required, and those which fall to the ground by the force of the wind or the violent shaking of the tree are almost always more or less injured. In raising fruit for market these injuries are elements of deterioration, and the fruit, whether apples, pears, peaches, or high growing and lasting fruits, should be presented to purchasers in the best possible state.

To secure these results is the design of the inventor, Mr. Wm. Brown, who patented his invention Feb. 5, 1867, and may be addressed at Box 1,021, Worcester, Mass.

TAYLOR AND LAFFERTY'S BROOM HEAD.

Metallic heads by which the broom corn can be attached to the handle are coming into common use. They are economical, although costing somewhat more in the first instance than the common brooms, because the handle and head need not be thrown aside soon as the corn is worn to stubs, but by a simple replacement of the comparatively cheap fiber the worn-out implement becomes again a broom.

The head in the engraving is of sheet metal, fastened at the top to a block through which is a hole for the reception of the handle. The handle tapers to the end, which is received in the socket of the yoke, through which pass two screws on each side of the handle, having on the outside of the case two metal braces for stiffening the box. The broom is introduced into the head, the butts being placed on each side of the central bar or yoke, until the head is filled, while the screws are slacked. These are then screwed up and by compression hold the broom very securely. It makes a light and handy implement.

A patent for this device was issued Sept. 11, 1865, to J, Taylor and R. M. Lafferty. For other information relative to it address J. E. Prutzman & Co., Three Rivers, Mich.

Exposition Notes.

THE LOCOMOTIVE GOLD MEDAL.—A letter in the *Boston Journal* gives the following circumstance connected with the award of the gold medal to the Paterson engine "America:" The Austrian and French members of the jury took exception to the "America" because it was so light in some of its parts. But fortunately the English member of the jury is well informed on locomotive engines and American engineering, and he explained that the railroads in America are of an entirely different construction from European roads; that the country is new, and the roads cheaply built, and the ties are subject to displacement from frost; that to ride over rough roads there must be elasticity in the machinery; that American engineers had difficulties to contend with wholly unknown to Europeans; that, taking all things into consideration, the American locomotive was superior to any other in the exhibition. His arguments were so convincing that the other jurors gave way and awarded the gold medal to the "America." This is a great triumph, and it has been achieved through the intelligence and honesty of the English juror.

AMONG the models, Thomas Dunn, of Manchester, illustrates a mode of erecting a steel bridge, by weaving straight bars into a self-supporting structure progressing from the shore, without supports or scaffolding.

A PARIS firm exhibit a machine automatically cutting, jointing, punching, countersinking and finishing sixty brass hinges per minute from the sheet metal.—Another Paris machine cuts cylindrical lucifer matches, ready for dipping, at the rate of one or two boxes per second. It consists of a slide carrying a row of parallel cutting tubes, made of a solid piece of steel, oscillating very rapidly, and cutting a row of matches at each stroke from the surface of a block of the proper length. A series of cutters on the same slide multiply the production to any desired extent.

THE English Society of Arts have made a handsome appropriation, and appeal to the public for funds, to aid artizans to visit the Exposition: a portion of the allowance being payable on the reception and approval of a report upon some object exhibited relating to the art or craft of the workman. The Lords of the Committee on Education have also proposed an allowance of $25 toward the expenses of any master engaged in schools of science and art under their direction, who may wish to visit the Exposition, coupled with a condition similar to the above, and with the addition of prizes of $100, $75 and $50 respectively for the best three reports in each department (science and art).

T. LABAT, of Bordeaux, exhibits a patent slip for drawing a ship out of water, consisting of a cradle horizontal on its upper surface, whereon the ship rests and thus retains her natural position, but with the under side parallel to the incline of the ways on which the whole is drawn out of the water. It runs on wheels traveling ten pairs of rails, and is drawn out of water with its load by ten long screws.

THE French Government exhibits a model of a submarine torpedo boat, propelled with a screw by compressed air. The roof is recessed to receive a small boat with a water-tight deck and manholes in its deck and bottom, and there is also an intermediate chamber, with manholes, beneath the recess in which the boat rests and having a water-tight connection with the boat: so that ingress and egress for the crew of the submarine vessel are practicable in comparatively rough water.

THE "CARRÉ" FREEZING APPARATUS has been set up in the park, to supply ice for the restaurants. It consists of a sort of boiler, in which ammonia is volatilized by heat until it reaches a pressure of five or six hundred pounds to the square inch, and by its sudden emission produces intense cold.

AMONG the outside objects is a chime of forty-three fine bells, weighing from 40 to 5,000 lbs. each, made for the cathedral at Buffalo, N. Y. The tunes are played by a great organ barrel, $4\frac{1}{2}$x$6\frac{1}{2}$ feet, and pierced for 6,000 pins, with which a great variety of airs can be set, the musical machine being actuated by a 2,500-lb. clock weight.

BREVAL'S TAN PRESS, which is on exhibition, is said to be capable of extracting instantaneously about 60 per cent of liquor from the bark, and of getting through with about 66 cubic feet of bark in an hour and a half, employing one horse-power.

A STEAM DRYING DRUM for cotton goods, by Turpin, of Rouen, is readily adapted to any width of cloths, from three to six quarters, and dries 600 yards per hour.

THE Industrial School of Tournay sends to the Exposition a pair of vertical engines, about 20 horse-power, the designs, patterns, castings, and the workmanship throughout, made by the boys of the school, who are from 16 to 20 years of age. It is felt that this visible illustration of itself gives a strong impulse to the idea of industrial schools in every country in Europe—we hope it will in America.

PARISIAN working hours are remarkably early—two or three hours earlier even than the English, it is said—and hence the day's work is done and the population are in the streets, gaily enjoying themselves, at an hour in the afternoon which in other countries is as busy and humdrum as any other in the day.

THE Lords of the Council on education have made arrangements for the conversion of the Museum of Irish Industry in Dublin into a College of Science. It will have ten professorships, seven of which already exist.

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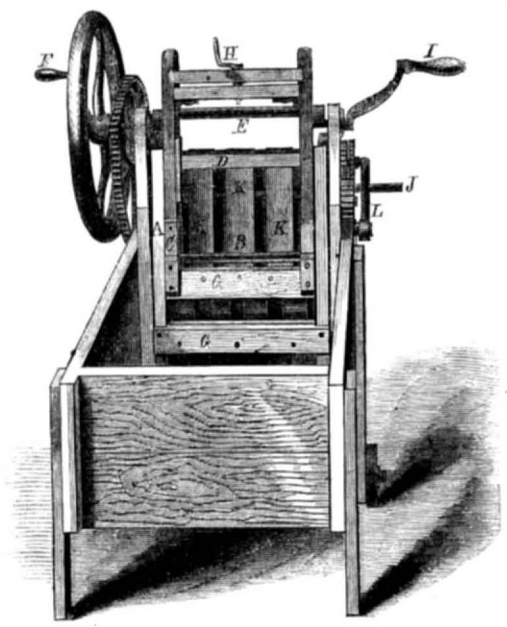
WHITE'S WASHING MACHINE.

The engraving is a perspective view of a machine whieh combines the operations of washing and wringing clothes, or which can be used for either of these purposes separately. It was patented through the Scientific American Patent Agency by Cassius A. White, of Fairfield, Vt., Feb. 26, 1867.

The apparatus is a rectangular box raised on legs to a hight convenient for operating, the front legs of which are furnished with castors or trucks by which it can be readily moved from place to place about the house, being wheeled in the manner of a barrow by means of pivoted handles at the rear end—not shown—which may be swung out of the way when the machine is in operation. Between upright standards forward of the center are hung two frames, the outer one, A, being piv-



oted to the uprights by a round bar, B, which serves also as a guide to the lower portion of the inner frame, C, in performing a vertical sliding motion, by means of slots in its side bars. The bar, D, is secured to the frame, C, and its projecting ends traverse in slots in the side bars of the frame, A. Two motions are given to both these frames by means of the crank shaft, E, which passes through a box in the ends of the cross bar near the top of the frame, C, and is driven by the fly wheel and crank, F; one is a reciprocating motion to the frame, C, and the other a swinging motion to both C and A. The lower cross bars, G, of the frames have faces of rubber, between which the clothes pass and by which they are cleansed from dissolved dirt. These faces of rubber are adjusted near together or apart by a screw, H, which depresses or raises the frame, C, on the shaft, E. These constitute the washing arrangements; but the washing frames may be driven by the crank, I, while the wheel, F, may be placed upon the driving shaft, J, of the wringing rollers, as desired.

These wringing rollers are of the ordinary construction, geared in the usual manner, and driven by the pinion attached to the fly wheel, F, through the medium of the large gear, which is attached to the upper roller. There is a device for passing the clothes as they are washed to the wringer by means of belts, K, which traverse through suitable guides over a series of upper and lower rollers, so arranged that the reciprocating motion of the washing frames delivers the clothes to the belts, by which they are passed between the wringing rollers. The motion of the rollers carrying the conveyor belts is assured by gears connected with the prime mover, F.

Although, from the description, the machine may appear complicated, it is in reality very simple, and there can be no straining or pulling of the clothes. When one portion of a piece needs more rubbing than another it can be done by adjusting the pressure on the rubbers or turning the crank, F, back and forth. The compression of the wringing rollers is regulated by the lever, L, which turns a shaft having a cam on each end to raise the boxes of the lower roller.

New Species of Swindling.

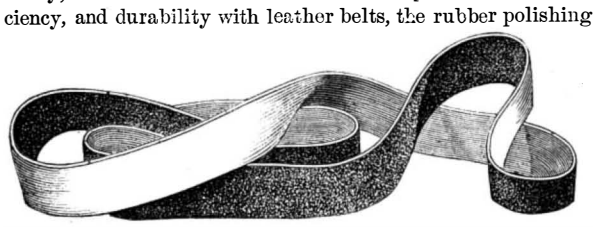
A new and successful kind of swindling has lately commenced, and been carried to such a profitable extent that a party of swindlers who have been brought to trial at Middletown, and Minisink, N. Y., had, as it is supposed, realized $150-000, twenty-five to thirty wagons, and from sixteen to twenty horses, before their arrest.

Proceeding to the country, the swindlers take different towns, and circulate among the farmers, to whom they offer patent rights of articles of ready sale. They represent the retail prices of such articles to be double or treble their cost to manufacture, and to show their confidence in the large profits that the farmers can make, they agree to sell the patent right for the note of the farmer, payable in one year. and that if he, the farmer, does not make profits, they will take back the right free of charge. If the farmer consents the swindler draws up the note, which the farmer signs, and in some cases, the swindler endorses the condition of payment upon its back.

When the parties separate, the swindler trims off the edges of the note with scissors, when the back separates from the front, the back having been neatly fastened to the front paper by mucilage upon the edges. Having thus rendered the note plainly negotiable, the swindler proceeds to the next farmer or merchant and gets it cashed, or gives it in payment for horses, carriages, wagons or other property, and then passes along to victimize another party. We hope the vagabonds will get their deserts.

ENDLESS RUBBER POLISHING BELT.

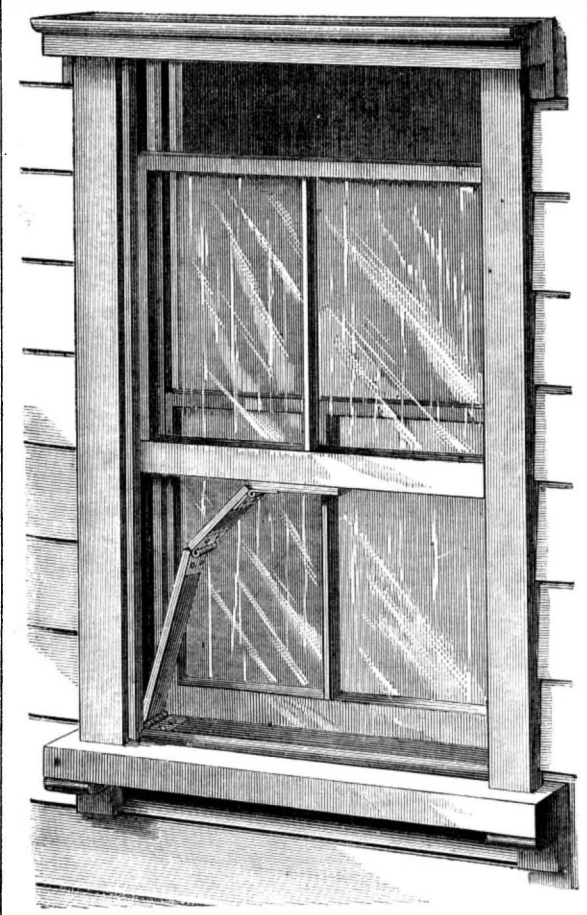
The emery or other polishing material is applied to this belt in the usual way. By the use of this belt a perfectly pliant and true surface is presented to act upon the work, which is so desirable and hard to secure in the use of leather belts. When much worn, it can be placed in water to soak off the old coating without injury, and by simply wiping the belt dry it will be ready to receive a new coating without the liability of the joints coming apart and without waiting for it to dry, as with leather belts. When compared in cost, efficiency, and durability with leather belts, the rubber polishing



belt is found to be far superior. These polishing belts are always perfectly flexible, pliant, and free from unevenness of surface. After repeated coatings of polishing material have been worn down and removed their unyielding property remains perfect, without perceptible change. By their use the work is better performed than by the use of the leather belts. Patented March 26, 1867. All communications should be addressed to Jeremy W. Bliss, No. 240 Main street, Hartford, Conn.

GRISWOLD'S SUPPORT FOR WINDOW SASHES.

The engraving shows a very simple device for holding the upper sash of a window in any position desired for ventilating a room. Springs and catches are more or less liable to become deranged, and weights, without some fastening, are temptations to children. The arrangement is a series of bars of differing lengths, hinged one to the other, and the lower one hinged to the window sill. These bars are of such a length, width, and thickness that when extended they fill the space in the window frame under the sash in which the sash slides. In the engraving the support is drawn out of the recess to show it, but in use only one or more of the sections are



turned down, while the remainder are in an upright position. When fully extended and in place, these bars are supports to the sash when closed, and when shut down on the sill the sash may be entirely lowered. One of these may be applied to each side of the window, each differing from the other in the lengths of the sections, thus giving a number of grades of hight to the sash. It is so cheaply and easily made and attached that where more elaborate and costly appliances are not readily attainable it will commend itself to all.

It was patented by Mrs. Ellen M. Griswold, Hagerstown, Md,, January 22, 1867, who may be addressed for further information relative thereto.

[For the Scientific American.]

THE COST OF ELECTRIC LIGHT.

The time appears to be near at hand when the electric light will be used for a variety of purposes. It is worth our while to inquire as to its cost. The expense and inconvenience attendant upon the production of electricity upon a large scale has hitherto been an obstacle in the way of using the electric light, except for lecture rooms and a few other purposes. But the recent improvements in the construction of magneto-electric machines and thermo-electric batteries have put it in our power to command the services of this beautiful illuminating agent on any desirable scale of magnitude.

In order to examine the question of cost intelligently, let us refer both electrical and illuminating effects to the common measure of power, viz., the foot-pound per minute. The experiments of Mr. Julius Thomson, of Copenhagen. have shown that the power to maintain the light to that of a standard candle for one minute is equal to the raising of a weight not exceeding thirteen pounds, one foot high in that time. I have arrived at a similar result from a reduction of recorded experiments made by Müller, Ritchie, myself, and others. I am satisfied that, where an electric light of not less than eight hundred to one thousand candles is produced, under proper management, the power required will not greatly exceed 15 foot-pounds per minute per candle. For smaller amounts of light the power required will be greater.

Now let us inquire what amount of electricity is the equivalent of, or is represented by 15 foot-pounds per minute. If 100 feet of No. 18 pure copper wire be coiled into a helix and immersed in a pound of water, and if the ends of this wire be connected to the poles of one cell of the Grove battery (pint cup size as used in telegraphing), the temperature of the water will begin to rise at the rate of 1° F. in 9½ minutes, or 0·105° per minute. Now if the temperature of one pound of water be raised one degree (Fah.) per minute, this effect will be the thermal equivalent of 772 pounds raised one foot high in space per minute; the heating effect then, of our Grove cell upon the water is the equivalent of $0{\cdot}105 \times 772 = 81$ (call it 80) foot-pounds per minute.

It is well known that a galvanic battery will perform its maximum work when the external resistance which it encounters is equal to the internal resistance of the battery. I have found the internal resistance of the pint cup Grove cell to be equal, on the average, to that of 100 feet of pure copper wire, No. 18 size. Hence the maximum external effect of the ordinary Grove cell may be set down as the equivalent of 80 foot-pounds per minute, equal to the production of $80 \div 15 = 5\frac{1}{3}$ candle lights. I would not be understood as saying that this amount of light can be produced by a single Grove cell, but that 1,000 cells, if properly arranged, would be capable of evolving somewhat more then 5,000 candle lights from a single lamp.

With sulphuric acid costing 2⅓ cents, nitric acid 10 cents, zinc 8 cents, and mercury 50 cents per pound, the cost of running 1,000 Grove cells one hour, while doing their maximum work, would be $27.65. This would give for 5,000 candles a cost of about 5½ mills per hour per candle.

The cost of gas light per candle per hour would be about one mill, if gas costs $3.25 per thousand cubic feet, and if one cubic foot per hour gives the light of three candles.

With the Smee battery, carefully managed, the cost of 5,000 candle lights would be about the same as with gas.

Let us now look at the cost of electricity as developed by the magneto-electric machine. The power expended on the machine is consumed in friction, in heating the wires, magnets, etc. On a well built machine which I examined in 1861. 1,100 foot-pounds per minute were required to keep the machine in motion when the circuit was open, and the machine doing no work. But when the circuit was closed 3,200 foot-pounds per minute were required to maintain the same velocity of rotation; nearly all this excess of power (viz., 2,100 foot-pounds) was measured as electricity, about two thirds (say 1,300 foot-pounds) being expended internally, heating the coils and magnets, etc., and the balance, 800 foot-pounds, measured as external useful effect. Had the external resistance been larger, a greater proportion of the expended power would have appeared as useful effect. Suppose, however, that only 800 foot-pounds per minute could be utilized by this machine and used for illuminating purposes. This would be the equivalent of $800 \div 15 = 53{\cdot}33$ candles, and the total power required (including friction, etc.) would be $3{,}200 \div 53{\cdot}33 = 60$, about sixty foot-pounds per minute per candle.

In the vicinity of Boston, power is furnished, per horse-power, at the rate of $180 per year of 313 days of 10 hours each, or at the rate of $\frac{\$180}{313 \times 10} = \$0{\cdot}0575$ (5¾ cents) per hour. If only one fourth of this power could be utilized as light, $\frac{33{,}000}{4 \times 15} = 550$ candles would be the equivalent of one horse-power, and would cost $\$0{\cdot}0575 \div 550 = \$0{\cdot}0001046$, about one tenth of a mill per hour per candle, being about one tenth the cost of gas light.

Let us for a moment take another view of the matter. The average hourly consumption of coal by a good steam engine may be set down at four pounds per hour per horse-power, $= (33{,}000 \times 60) \div 4 = 495{,}000$ foot-pounds from one pound of coal. Utilizing as electricity, and thence light, one fourth part of this, we get $495{,}000 \div 4 = 123{,}750$ foot-pounds, or as light, $\frac{123{,}750}{15 \times 60} = 137{\cdot}5$ hour candle lights from one pound of coal, through the agency of the steam engine and the magneto-electric machine.

With the thermo-electric battery I have been able to develop 130,000 foot-pounds of electricity from one pound of coal $= \frac{130{,}000}{15 \times 60} = 144{\cdot}4$ = to about 144 candle lights.

There is still another point of view worthy our attention. Common gas coal will yield about ten thousand cubic feet of gas per tun. This, at three hour candle lights per cubic foot, would give $(3 \times 10{,}000) \div 2{,}000 = 15$ hour candle lights per pound of coal. About twenty-five cubic feet of illuminating gas weigh one pound. Hence one pound of gas, after it is made from the coal, will yield a light equal to that of a candle for seventy-five hours. One pound of pure carbon, wholly burned to carbonic acid gas, yields 14,500 units of heat, equal to $772 \times 14{,}500 = 11{,}200{,}000$, or 11⅕ millions of foot-pounds of work: hence, were the total energy of one pound of pure carbon converted into light, it would be equivalent to one candle light for the time of $\frac{11{,}200{,}000}{15 \times 365 \times 24 \times 60} = 1\frac{5}{7}$: one year and five months.

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To recapitulate: the gas made from one pound of coal would yield a candle light for fifteen hours; one pound of the gas would yield a light equal to one candle for seventy-five hours; but could all the energy in a pound of carbon be converted into light, it would be equivalent to the burning of a candle for 12,410 hours.

Thus it will appear that by our ordinary methods of gas lighting we utilize much less than one per cent of the energy stored in the coal. I think we may reasonably expect that electricity, as developed by the thermo-electric battery, the magneto-electric machine, or some still more efficient apparatus, will help us in some way to bridge the chasm between fifteen and twelve thousand hour candle lights from a pound of coal.

MOSES G. FARMER.

Salem, Mass.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

"Wirbel-Bewegung."

MESSRS. EDITORS:—Are you aware that smoke rings are frequently produced during the firing of light and heavy ordnance, from smooth bore as well as from rifle cannon, and from 3-inch to 15-inch calibers? Sometimes they proceed from the vent, but I think the more beautiful ones are from the muzzle. They appear of a double character, a ring within a ring, and always remind me of the rings of Saturn. During the firing of the 8-inch rifle in April last at this post, one stormy day I observed a double smoke ring unravel itself from the clouds of smoke. It gradually ascended, moving with considerable velocity against a head wind in line of fire, and continued to rotate distinctly for several minutes, expanding by degrees and throwing off a stream of smoke from the outer edge. The space within the inner ring on this as on all occasions was free of smoke. Meantime the general smoke of discharge was blown quickly to the rear and over the ramparts, being a very unexpected sight. I called the attention of the Captain of Ordnance and of others to the fact, that the smoke rings on occasions moved against a head wind.

Prof. Nichol, author of the "Architecture of the Heavens," puts forth the theory that the gaseous heavenly bodies may throw off rings while in the nebulous state, being a result of the combined actions of contractions and rotations. He thinks the rings may break up and form satellites. He says, "were an elastic belt placed on a wheel and driven with great velocity, the belt would stretch and rotate by itself, and would continue so doing were it not for the earth's gravitations; but it appears now evident that rings of nebulæ may be formed under other conditions.

T. T.

Fortress Monroe, May 13, 1867.

Russian America.

For a distance of nearly 1,000 miles, says a writer in the New York *Times*, the whole coast is thickly studded with islands of all sorts and sizes. The inland waters formed by these islands are as calm and unruffled as a mill pond. In the summer season it is a paradise for those who have no other goal in view than to exist in a free, untrammeled atmosphere, skim tranquilly along the quiet waters in light canoes, and at night pitch their tents on the nearest island. There is always plenty of game to be found. Besides water fowl of every description, the larger islands mostly abound with elk, deer, black bear and grouse.

The main land presents a series of inlets and arms of the sea, running far into the heart of the lofty coast range. There is scarcely an acre of decent farming land to be seen; in fact, we may travel a long distance and not discover a spot level enough to build a good sized house on.

The Stiken River is the fourth in volume and size on the west coast of North America, ranking after the Columbia, the Colorado and the Frazer. It empties itself by three channels into the Pacific, 70 miles below Sitka, and in about 57 degrees north latitude. It took us four and a half days to ascend 170 miles, while in descending the same distance the vessel made the journey in less than sixteen hours. For the first hundred miles or so, the river is walled in by huge mountains with peculiarly sharp volcanic cones or peaks, rising one above the other and covered with snow. The scenery is of the grandest and most stupendous nature, and our little steamer, staggering and trembling against the swift current of the river, seemed a very cockle shell in the presence of these vast and silent creations of the Almighty. The most extraordinary natural feature that attracted our attention was a glacier or field of blue ice, about 40 miles up, on the north bank of the river. It is about 150 feet high on the river, and extends along the edge of the stream for eight miles, running back into a valley among the mountains as far as we could see. A cañon was finally reached, which baffled all attempts to pass through or around it, although several bold miners lost their lives before their companions gave up the hopeless effort to navigate the canon in their canoes. A land journey of 100 miles failed to find any practicable approach to the river, which was left unexplored farther.

A GRINDSTONE should not be exposed to the weather, as it not only injures the woodwork, but the sun's rays harden the stone so much as, in time, to render it useless. Neither should it stand in the water in which it runs, as the part remaining in water softens so much that it wears unequally, and this is a very common cause of grindstones becoming "out of true."

THE income of McCormick, the noted patentee of the reaping machine, was last year, $169,760

LIFE-SAVING INVENTIONS.

The labors of the Commissioners are at last finished, the Board having adjourned on Friday, May 24. It will necessarily be several weeks, however, before their voluminous report will be ready for publication. Below we give our readers a full list of all the inventions presented for examination, kindly furnished us by the secretary of the board, Mr. W. A. Duphy. This, we may remark, is the only complete list yet published:

1. F. I. Latham ..... Sheet anchor.
2. F. J. Speckman and N. Hand ..... Water gage.
3. Levy Brothers ..... Fire extinguisher.
4. Wm. N. Clark ..... Mode of hanging rudder
5. Wm. N. Clark ..... Water cask and life boat combined.
6. W. P. Glenshy ..... Mode of sealing boilers and tubes.
7. W. A. Devon ..... Lowering, detaching and davits.
8. Thos. L. Reed ..... Detaching apparatus.
9. J. W. Bogart ..... Apparatus for unlashing boats.
10. James Higbee ..... Improvement in steering apparatus.
11. James Gregory ..... Gage cocks, water gages, etc., comb.
12. James Gregory ..... Steam whistle.
13. Peter Scoffeld ..... Steam gage.
14. Daniel N. Beard ..... Self-unhooking eye bolt.
15. Thos. J. Brown ..... Sleeping berth and life boat combined.
16. Clinton Roosevelt ..... Method of building vessels.
17. Clinton Roosevelt ..... Method of anchoring vessels.
18. N. Giroud ..... Steam gage.
19. M. V. & S. C. Nobles ..... Detaching apparatus.
20. John Mitchell ..... Detaching apparatus.
21. E. Goulard ..... Hydrostatic unsubmersible vessel.
22. Smith & Henis ..... Magnetic water gage.
23. Smith & Henis ..... Jacket for same.
24. A. Hicks ..... Steam steering apparatus.
25. Bisbee & Co ..... Anti-incrustator.
26. R. H. Dale ..... Regulator for propellers.
27. S. Barms ..... Low water detector.
28. Geo. W. Lamb ..... Metallic life buoy and life raft.
29. C. W. Copeland ..... Locked valve.
30. D. P. Davis ..... Pressure indicator.
31. James E. Cole ..... Character of ocean water.
32. M. T. Davidson & Co ..... Steam gage.
33. C. G. Meinhardt ..... Life boat, lowering device, and mode of constructing vessels.
34. J. F. Brown ..... Low water reporter.
35. E. D. Taylor ..... Duplex slide valve,
36. Wilson & Hauer (Louis Bauheffer) ..... Life-saving mattrass.
37. W. C. Marshall ..... Fire apparatus.
38. C. F. Matorana ..... Depression of water.
39. Thomas W. Roys ..... Life Barge.
40. N. B. Allen ..... Detaching apparatus.
41. James McMurchy ..... Safety valve.
42. J. R. Vaughan ..... Life boat.
43. Charles Rackett ..... Life preserver.
44. J. Harrison ..... Boiler.
45. Moore & McFarland ..... Detaching apparatus.
46. Peterson & Gunner ..... Detaching apparatus.
47. Peterson & Gunner ..... Self-furling Sails.
48. Hargrave & Bibber ..... Detaching apparatus.
49. J. J. McIntyre ..... Patent storm anchor.
50. Carl Hennig ..... Propeller.
51. George Hull ..... Detaching apparatus.
52. John A. Olmstead ..... Life boat and trunk combined.
53. J. W. Bogart ..... Patent car brake.
54. George M. Allerton ..... Life boat and raft.
55. George Henyston ..... Self-acting boat hook.
56. Frank Marguard ..... Life preserver.
57. Charles H. Hasker ..... Boat lowering and detaching app.
58. Marcus Hanan ..... Boat detaching apparatus.
59. Abraham G. Polhemus ..... Fire apparatus.
60. N. McKay ..... Life saving tackle.
61. Henry Hannen ..... Ship bed.
62. R. E. Everson ..... Life boat.
63. James Murtagh ..... Life raft.
64. Wm. R. Black ..... Self-detaching hook.
65. J. Hiles ..... Water gage and steam alarm.
66. Philip S. Justice ..... Steam gage.
67. Egbert P. Watson ..... Low water signal.
68. John Ryder ..... Life raft and gutta percha bolster.
69. N. Spencer Thomas ..... Anti-incrustator.
70. S. G. Cabbell ..... Anti-incrustator, broom, and screw for cleaning boiler.
71. S. G. Cabbell ..... Anti-incrustator.
72. S. G. Cabbell ..... Marine atmospheric alarm signal.
73. S. G. Cabbell ..... Door for ship's cabin.
74. Fletcher & Harrison ..... Safety valves.
75. John Zindorff ..... Saiety valves.
76. Richard Montgomery ..... Steam boiler.
77. Joseph A. Miller ..... Anti-incrustator.
78. George W. Brown ..... Patent roelock and thole pin.
79. James Isted ..... Life raft.
80. John W. Doughty ..... Syphon feed regulator.
81. Boyd Elliott (Well's) ..... Automatic Boiler Feeder.
82. James T. Horam ..... Safety valve.
83. E. A. Turner ..... Steering apparatus.
84. Carlish, Mason & Co ..... Locked safety valve.
85. Carlish, Mason & Co ..... Detaching apparatus.
86. Carlish, Mason & Co ..... Water gage.
87. C. L. Frink ..... Water gage.
88. C. L. Frink ..... Safety valve.
89. H. N. Winans ..... Anti-incrustator.
90. Worden, Rensford & Co ..... Syphon pump.
91. S. Bickerstaff ..... Safety valve.
92. S. Bickerstaff ..... Low pressure valve.
93. G. H. Clemens ..... Detaching apparatus.
94. S. B. Palmer ..... Low water alarm.
95. E. R. Stillwell ..... Feed water purifyer.
96. T. C. Banks ..... Alarm gage.
97. G. H. Hart and E. Lumley ..... Patent rudder.
98. S. B. Coit & Co ..... Steam gage heater.
99. F. Fellingham ..... Detaching apparatus.
100. John Ashcroft ..... Low water detector.
101. James M. Miller ..... Heater and surface condenser.
102. Wm. R. Bagley ..... Detaching apparatus.
103. James S. Newell ..... Apparatus for cleaning boiler tubes.
104. James S. Newell ..... Spring traveler.
105. Brown & Level ..... Detaching apparatus.
106. Wm. A. Lighthall ..... Surface condenser.
107. Kubach & Clay ..... Fire alarm telegraph.
108. Brown & Level ..... Detaching apparatus.
109. G. G. Forshey ..... Steering apparatus.
110. Julien M. Constantin ..... Patent lever for furling sails from deck.
111. Edw. J. Monk ..... Detaching apparatus.
112. Josiah Foster ..... Settee boats.
113. John W. Hill ..... Safety valves.
114. George Shone ..... Locked valves.
115. George Shone ..... Hose coupling.
116. Flowers, Patten & Co ..... Boat lowering and detaching apparatus
117. Flowers, Patten & Co ..... Locked davits and cradle.
118. Benedict, Torry, and Gurwibly ..... Combination hose.
119. George T. Palmer ..... Patent floating (apparatus) anchor.
120. Henry Mosley ..... Anti-incrustator.
121. Henry Mosley ..... Detaching apparatus.
122. George F. Palmer ..... Ship's windlass and pump gear.
123. Lorenzo Fulton ..... Low water indicator.
124. W. H. Low ..... Safety valve.
125. James Marks ..... Self-riding life boat.
126. William Moses ..... Detaching apparatus.
127. J. W. Stiles ..... Water ejector.
128. Farren, Traft, and Knight ..... Safety valve.
129. John Ashcroft ..... Patent felt protector.
130. Thomas Hanvey ..... Wood, etc., preserver.
131. William P. Hunt ..... Steering apparatus.
132. Lewis Younans ..... Low water detector.
133. Henry Mosley ..... Glass for cylinder for use of carbonic acid gas.
134. Henry Mosley ..... Amalgamation of copper and cobalt.
135. Snow and Hurlburt ..... Detaching apparatus.
136. F. Fellingham ..... Life-preserving berth.
137. B. F. Miller ..... Safety vessel.
138. G. B. Massey ..... Detached apparatus.
139. G. B. Massey ..... Leakage alarm gage.
140. Osborn and Massey ..... Hose coupling.
141. John J. Clyde ..... Movable life-preserving berth.
142. M. W. Brown ..... Fire-proof paint.
143. John Sutton ..... Direct-acting safety valve.
144. H. L. Brevoor ..... Leakage indicator.
145. E. H. Covel ..... Combination pump.
146. W. M. Arnold ..... Steering gear.
147. A. L. Shears ..... Self-baling life boat.
148. William Porter ..... Self-acting pump.
149. O. Warden ..... Signal light.
150. J. D. Mason ..... Detaching apparatus.
151. J. D. Mason ..... Life boat.
152. J. D. Mason ..... Patent anchor.
153. L. D. Ingoldsby ..... Mode of picking up boats at sea.
154. L. D. Ingoldsby ..... Steering and manœuvring sail & steam vessels.
155. B. Smith ..... Surf boat.
156. B. Smith ..... Life boat.
157. B. Smith ..... Ventilator.
158. B. Smith ..... Steering apparatus.
159. J. N. B. Bond ..... Steam boiler feeder and low water detector.
160. J. N. B. Bond ..... Steam generator.
161. Henry Dirkes ..... Improved life boat.
162. Henry Dirkes ..... Method of anchoring.
163. D. Regester ..... Self-adjusting hook.
164. H. D. Teuksburry ..... Hose coupling and pipe.
165. Abraham Inslee ..... Safety valve.
166. Marine Signal Company ..... Fog trumpet.
167. Benjamin Sneden ..... Life boat, surf boat detaching apparatus
168. Walter P. Burroughs ..... Boat detached apparatus.
169. Bright O. Kirk ..... Blower.
170. E. H. Ashcroft ..... Low water detector.
171. G. A. Lillienthall ..... Telegraphic night signal.
172. G. A. Lillienthall ..... Line rocket.
173. John Wright ..... Life raft.
174. James McDonough ..... Self-inflating raft
175. James McDonough ..... Life boat.
176. G. F. Darling ..... Detaching apparatus.
177. Henry Matthews ..... Life-preserving seat.
178. John Kennedy ..... Apparatus for laying-to in a gale.
179. Henry Leoratt ..... Locked valve.
180. R. Robinson ..... Locked valve.
181. — Doyle ..... Detaching apparatus.
182. Charles F. Brown ..... Patent anchor.
183. John E. Cooper ..... Folding water anchor or drag.
184. J. H. Holbrooke ..... Electric annunciator.
185. E. A. Wood ..... Steam gage.
186. Benjamin Smith ..... Improvement in constructing vessels.
187. A. H. Colt ..... Patent granulated cork bedding.
188. Charles C. Teaton ..... Double lock-up safety valves.
189. R. W. and D. Davis ..... Patent boiler.
190. Thomas Huntington ..... Boat detaching apparatus.
191. Isaac Decker ..... Anti-incrustator.
192. B. I. Kellum ..... Patent oar.
193. W. Craig ..... Hose coupling.
194. Wilbert Banacliff ..... Improved life boat.
195. Barney McGinnus ..... Steam boiler.
196. Henry McDonough ..... Life boat elevator.
197. Charles Perley ..... Detaching block.
198. Charles Perley ..... Hose coupling.
199. John A. Fulton ..... Anti-incrustator.
200. Joseph Wood & Co ..... Steam valve pump.
201. Robert H. Griffin ..... Patent apparatus.
202. Daniel Barnum ..... Air-pump attachment.
203. N. H. Marston ..... Gage cock.
204. W. C Thompson ..... Life saving raft.
205. John B. Holmes ..... High and low pressure boiler.
206. F. E. Sickles ..... Steam steering apparatus.
207. John Golding ..... Life-saving mattrass.
208. Dr. Mannus Prister ..... Propeller steering apparatus (withd'n).
209. C. C. Peck (H. O. Maynard) ..... Safety hook.
210. James R. & Edward Dryburgh ..... Impt in steam chimneys of boilers.
211. Lyman S. Fitch ..... Detaching apparatus
212. J. E. Culver ..... Steam generating apparatus.
213. H. L. Stibbs ..... Temporary rudder.
214. William Carter ..... Detaching hook.
215. John Shaffer ..... Safety valve.
216. John Schaffer ..... Fusible alloy plug.
217. Thomas Mitchell ..... Steam generator.
218. Charles Magge ..... Anti-incrustator.
219. Charles Magge ..... Low water alarm.
220. A. Carr ..... Low water alarm detector.
221. Henry Payne ..... To prevent collision of locomotives.
222. L. and H. Raymond ..... Lock-up detaching apparatus.
223. G. H. Wilson ..... Satcrlee's patent davit block.
224. Armstrong and Brown ..... Patent anchor.
225. W. C. Dodge ..... Detaching apparatus.
226. John Irlam ..... Engine piston.
227. Geo. O. Evans ..... Low water detector and alarm.
228. J. G. and J. Edge ..... Signal lights, rockets, and line rockets.
229. Pollock and Van Wagenen ..... Detaching apparatus.
230. Francis N. Gove ..... Steering apparatus.
231. Alonso Temple ..... Anti-incrustator.
232. E. Kellam ..... Detaching davit and cat block.
233. Geo. W. Richardson ..... Safety valve.
234. Chas. H. Baxter ..... Life preserving spar.
235. R. B. Donaldson ..... Steam gage.
236. Emile Roussell ..... Life preserver.
237. J. H. A. Gericke ..... Turbinate force pump.
238. Parr, Fox & Robertson ..... Monitor and armor plated vessels.
239. Henry H. Pember ..... Improvement in hanging rudder.
240. J. S. Jackson ..... Detaching apparatus.
241. Oliver Salgee ..... Hose coupling.
242. S. Beckerstaff ..... Low water detector.
243. J. B. Russell ..... Covington's steering apparatus.
244. John R. Grace ..... Surf Boat
245. T. C. Banks ..... Leak signal.
246. James Cochrane ..... Pilots listening trumpet for fogs.
247. Charles Dion ..... Fire alarm.
248. Howard and Chase ..... Adjustable gage lock.
249. J. N. McIntyre ..... Life raft.
250. Daniel Clark ..... Fog signal.
251. Charles F. Ruset ..... Improvt. in steam and other engines.
252. Edward L. Brown & Co ..... Gage cock whistle.
253. J. R. N. Owen ..... Spec. and draw'g elliptic rotary pump
254. G. Symmes ..... To equalize exp. and to generate steam.
255. John A. Schule ..... Improved motive power.
256. John McKenzie ..... Self-acting pump.
257. J. W. Fox ..... Bartlett's expelling pump.
258. John A. Hollins ..... Improved steering apparatus.
259. Tait and Avis ..... Improved steam boiler.
260. E. B. Tannever & Co ..... Side lights.
261. Frank D. Bingham ..... Surge reliever.
262. E. Spencer ..... Steamboat wheel.
263. Geo. Unit ..... Ice navigator.
264. Mee and Jackson ..... Hose coupling.
265. John A. Rollins ..... Shipping rudder.
266. B. F. McAlhattan ..... Ship's bed.
267. E. A. G. Roulstone ..... Life raft.
268. Wm. Ayeres and Overton ..... Patent anchor.
269. James Benson ..... Feathering paddle wheel.
270. F. S. Schlesinger ..... Patent steering indicator.
271. Elijah Williams ..... Boat propellor.
272. Samuel B. Nowlan ..... Vertical cut-off steam safety valve.
273. Samuel B. Nowlan ..... Geometrical steam mercury gage.
274. Samuel B. Nowlan ..... Exhaust for sanitary ventilating ships.
275. Samuel B. Nowlan ..... App. for gen'g steam without a boiler.
276. Samuel B. Nowlan ..... Air cells to prevent found'g of ships.
277. John Quigley ..... Flooding machine & fire extinguisher.
278. P. H. Vander Weyde ..... Anti incrustator.
279. S. S. Chandler ..... Lowering and detaching apparatus.
280. Asahel Abbott ..... Repeating quadrant.
281. John T. Ashley ..... Water-proof safe.
282. F. E. Sickles ..... Model and tank for boat.
283. John T. Ashley ..... Floating berth.
284. Charles K. Parshall ..... Model of a safety valve
285. D. F. Morseman ..... Power Governor.
286. Philip Hoelzel ..... Improved steam generator.
287. A. F. Crossman ..... Boat-lowering and hoisting apparatus.
288. C. Williams ..... Life buoy.
289. I. W. Reids ..... Improved tubular boiler.
290. Alvin Walker ..... American submerged ship pump.
291. R. Fletcher ..... Tidal alarm apparatus.
292. Charles Hopkins ..... Larsdelle's double-suc'n steam siphon.
293. R. Waddell ..... Hydraulic marine governor.
294. W. Fitz James Thiers ..... Hydro'c ventilator & auto'c ship pump.
295. A. T. Hayes ..... Anti-incrustator.
296. A. Arnold ..... Danger indicator
297. John Sloan ..... Self-propelling life boat.
298. C. H. Griffin ..... Automatic water inspector.
299. Charles M. Cresson, M. D ..... Anti incrustator
300. Bond, Turnbull & Co ..... Steam-boiler feeder.
301. Edward Bradly ..... New mode of applying safety valves.
302. Morgan Shepard ..... Lock-up safety valve.
303. Henry T. Brown ..... Eubank's impt. on steam engine.
304. Dr. J. Bryant ..... Patent bushings, etc.
305. William D. Andrews and Bro ..... Andrews' steam pump.
306. John Golding ..... Fog signal.
307. Edward Snell ..... Snell's patent anchor.
308. Springer and Bartram ..... Boiler water gage.
309. Charles Wing ..... Signal lamp.
310. Thomas Silver ..... Marine steam-engine governor.
311. Charles W. Copeland ..... Wire tiller rope.
312. Norman L. Wheeler ..... Wheeler's boiler.
313. A. C. Stimers ..... Frazee's life boat.
314. R. H. Andrews ..... Single-acting force pump.
315. Charles W. Copeland ..... Fusible plugs.
316. Rav's (Woodward) ..... Ventilator & marine fire protect'n app.
317. C. W Walley ..... Life-preserving raft.
318. J. F. Brown ..... Detaching apparatus.
319. Jos. Humphries ..... Floating anchor and life preserver.
320. W. C. Thompson ..... Life raft.
321. Benj. Palmer ..... Comb. matt. and life-preserving float.
322. Williams & Gee ..... Detaching apparatus.
323. Edward O. Banks ..... Detaching block.
324. A. Kauffman ..... Anti-incrustator.
325. James Eccles ..... Water indicator.
326. James Marks ..... Holmes' self-righting life boat.
327. Richard Atwell ..... Plan to prevent incrustation.
328. Laurence F. Frazee ..... Boat-lowering apparatus.
329. L. Frazee ..... Boat-lowering apparatus.
330. Esau Rowing ..... High-pressure boiler.
331. A. C. Crondal ..... Cork matt. cushion, and life preserver.
332. J. R. Taylor & Co ..... Brown & Harfield's windlass.
333. C. Warden ..... Signal light.
334. E. Buckman ..... Ship drag.
335. Jno. H. Marr ..... Anti incrustator.
336. A. Gilman ..... Shipping rudders at sea.
337. Prof. Ogden Doremus ..... Exting'ng fire by liquid carbonic acid.
338. John M. Sturgeon ..... Non-inflammable fluid.
339. Keen Brothers ..... Steam gage.
340. American steam-gage Co ..... Steam gage.
341. J. A. Libbertz ..... Detaching apparatus.
342. J. W. McKenzie ..... Water tank.
343. Mr. Ryan ..... Wappich's rudder braces.
344. Thomas A. Devyr ..... Method of constructing ships.
345. Brown & Newman ..... Water expeller.
346. Kenyon & Co ..... Steam steering apparatus.
347. Capt. Franzen ..... Steering indicator.
348. W. D. Andrews & Bro ..... Super-heating steam boiler.
349. John Moody ..... Life boat.
350. John Moody ..... Light ship.
351. Mr. Raymond ..... Self-trimming patent wind sail.
352. L. Raymond ..... Rowlock.
353. F. Kennedy ..... Engineer's signal bell.
354. R. F. Crane ..... N. W. Mfg Co's low water indicator.
355. A. C. Boon ..... Wing life boat.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

CONVERTING RECTILINEAR MOTION INTO ROTARY.—J. A. Ehle, Greenburgh, Wis.—This invention consists in operating a balanced lever or working beam with sliding carriages and hooks attached, upon polygons or triangles, so that the power shall be transmitted to a shaft in a continuous rotary motion.

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WASHING MACHINE.—G. R. Hughes, Centralia, Miss.—This invention consists in constructing a washing machine somewhat upon the plan of the common pounding barrel, but still very unlike it and partly more efficient in its operation and appointment.

ADJUSTABLE ECCENTRIC.—J. B. Strickland, Scranton, Pa.—This improvement relates to the manner in which an eccentric is secured to the shaft or axle of the locomotive or other engine, and to the manner in which it may be changed to suit the lead of the engine valve.

BEDSTEAD.—Isaac Pedrick, Bridgeton, N. J.—This invention has for its object to furnish an improved bedstead so constructed and arranged that the weight upon the bed bottom may press against the shoulders or ends of the side and end rails; so that the posts may be detached without taking the bed bottom apart; and that the slats may be easily turned over for dusting.

CATCH FOR DOOR LOCKS.—G. W. DaCunha, New York City.—This invention consists in an improved catch or nosing for door locks formed with a flange to project along the jamb, and with a flange to project along the casing, the whole being cast solid in one piece.

ANIMAL TRAP.—J. W. Hollingsworth, Salem, Ind.—This invention has for its object to improve the construction of the animal trap patented by the same inventor and numbered 58,826, Oct. 16, 1866.

CAR COUPLING.—W. A. Stowell, Moretown, Vt.—This invention has for its object to furnish an improved car coupling, simple in construction and effective in operation, which shall be self coupling and which may be uncoupled without passing between the cars.

GATE.—Jacob Vail, Beloit, Wis.—This invention has for its object to furnish an improved gate strong, simple and durable, and which may be opened and closed by the driver without getting out of the vehicle.

DISINFECTING SEAT FOR PRIVIES, ETC.—Neil Clifford, A. N. Bell, Brookyln, N. Y.—This invention consists in so combining with the seat of a privy, or other similar place, a receptacle for deodorizing or disinfecting, and in so connecting it with the said seat, that when such seat is used said deodorizing or disenfecting material will be thereby discharged into the vault below the seat.

STOVES.—A. Lee, St. Paul, Min.—This invention consists in an arrangement whereby the radiating surface of the stove is greatly increased, and fuel is economized.

CULLENDER BOILER.—B. F. Porter, Manchester, N. H.—My invention consists in combining with the common culinary boiler, the essential feature of the cullender or strainer, and also in dividing the space in the boiler by partitions which are removable at pleasure and also in providing means by which the cullender boiler may be used as a steamer.

RAKES.—J. M. Long, Hamilton, Ohio.—This invention has for its object to furnish an improved rake so constructed and arranged that the weight of the driver may cause the rake to act promptly when unloading, and so that when the rake teeth revolve up to unload, the shafts and the fingers may go down disengaging the rake teeth from the collected hay in much less time than can be done with other rakes.

SAFETY LAMP.—H. Weston, Towanda, Pa.—This invention has for its object the obviating of accidents which now occur in using lamps provided with kerosene, or other similar volatile hydro-carbons as a burning material. As the burning material is consumed the gradually enlarging space above it in the lamp becomes occupied by vapor or gas which is highly explosive, and which, if a loose wick be used in the burner, is very liable to be ignited by the flame, especially in blowing out the flame, which is frequently done after using the lamp, the wind driving the flame down around the loose wick into the body of the lamp. My invention has further for its object the prevention of the leakage of the burning material from the burner, which now occurs in a greater or less degree in using the ordinary lamps, and which runs down the sides of the same, soiling the hands when the lamps are grasped.

STRIPPING THE LEAVES FROM SORGHUM OR SUGAR CANE.—James A. Campbell, Kent, Ohio.—This invention relates to a new and improved machine for stripping leaves from sorghum and other sugar cane and also for depriving the stalks of their tops so that the cane will be fully prepared for the rolling or crushing mill.

MACHINE FOR RAKING, AND PITCHING OR LOADING HAY AND GRAIN.—Leopold De Laceé, Springfield, Ill.—This invention relates to a new and improved machine for raking and pitching hay and grain from the field as left by the mowing or reaping machine, and depositing the hay or grain upon wagons or carts, thereby enabling the farmer, with the aid of one or two men, to safely harvest and put under cover in a given time as much hay or grain as can be cut by two machines.

METHOD OF PREPARING AND PACKING OIL.—P. G. Finn, Erie, Pa.—This invention relates to a new and improved method of preparing and packing coal oil for transportation and storage.

BEEHIVE.—B. S. Haviland and E. H. Haviland, Fort Dodge, Iowa.—This invention relates to a new and improved beehive of that class in which a plurality of colonies are kept, within a single box or house. The object of the invention is to afford a circulation of air through the several hives in the box or house so that the animal heat from all the bees will circulate freely through it, and in case of a weak colony being in the box or house it will reckive a requisite amount of warmth from the others. The invention has also for its object the isolating of a hive from the others when necessary, in order that an empty hive may be cut off, so that those containing colonies may receive all the benefit of the animal heat, the circulation of the latter being confined to the inhabited hives.

DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.—This invention relates to a new and improved contrivance for elevating ice from the river, pond or lake where it is cut, into the ice house contiguous thereto.

BOX FOR HOLDING POWDER OR PULVERULENT SUBSTANCES.—George A. Moss, New York City.—This invention relates to a new and improved box for holding powder or pulverulent substances and is designed for putting up for sale those powders which are used, or applied for use, by sprinkling them from a perforated cover, such, for instance, as blue or indigo powder used in the laundry for clothes, the box in which the powder is put up and sold answering, by simply perforating the cover, to sprinkle or shower the powder from.

PORTABLE SEAT.—James F. Campbell and Cornelius Tinney, Williamsburgh, N. Y.—This portable seat is intended more particularly for use by drivers on street cars, and it is of such a construction that it can be readily applied and detached, and when applied adjusted to any position desired.

HOG HOLDER.—W. and C, Leffingwell, Clarksburgh, Ohio.—This invention relates to an improved hog holder for ringing, wiring or snouting, or for slaughtering hogs, and consists of an adjustable box capable of admitting one hog at a time, and of being adjusted to the size of the hog so that he cannot turn, and of holding his head fast in the position required, whereby the dangers and difficulties attendant on the present mode of handling hogs for the above purposes as well as the injurious effects thereof upon the hogs, are entirely obviated.

CAR COUPLING.—W. H. Mays, Hillsburgh, Nova Scoila.—This invention relates to a new and improved car coupling of that class which are commonly termed self-acting or self-coupling, and it consists of a draw hook attached to one draw head and a projection or ledge attached to the other draw head for the hook to catch over; the above parts being used in connection with a releasing or disengaging mechanism, whereby the coupling of two cars, when they come in contact, is rendered certain, and the ready disconnecting of the same, when necessary, effected.

LIME KILN.—George Atkins, Sharon, Pa.—This invention relates to an improved mode of constructing kilns for burning lime and consists in forming the bosh of the kiln in the shape of a truncated cone, based on an inverted cone, similar in its general conformation to that of a blast furnace, and provided with two tiers of furnaces which extend into the body of the kiln and open directly into the chamber, to throw the heat uniformly throughout the mass of limestone combined therein, and thus burn the lime better.

EQUATING SOLAR CHONOMETER.—L. Mifflin, Germantown, Pa.—The object of the equating solar chronometer embraced in this invention is to exhibit the mean or clock time of day in lieu of the solar time.

PRUNING SHEARS.—Peter Keck, Zanesville, Ohio.—The nature of this invention consists of a combination of three levers to form a pruning shears whereof the cutting blade has a convex edge, the levers being so attached as to produce a drawing cut, and has for its objects increased facility in the use of the pruning shears, and the production of a clean cut.

COMPRESSION COCK.—Charles M. Alburger, Philadelphia, Pa.—This invention relates to an improvement in compression cocks or faucets and consists in raising the valveseat by forming it with a flange or bead around the edge to receive upon it a washer made of block tin or other suitable substance placed on the lower end of the spigot, in order to make them perfectly water and steam tight.

GAS APPARATUS.—B. L. Fetherolf, Tamaqua, Pa.—This apparatus is designed for generating illuminating gas from petroleum for family use, by applying a gas generator to an ordinary cook or heating stove, like a water back or fire brick lining, and thus by means of the fuel used for domestic purposes supplying the house with light as well as heat, and making a saving.

GANG PLOW.—James W. Sursa, San Leandro, Cal.—This invention relates to an improvement in gang plows, and consists in the arrangement of a device for raising and lowering the plows whereby they may be set at any required depth for working, or elevated above the ground to clear it entirely when the plow is moved from place to place.

ENVELOPE.—Ralph S. Jennings, New York City.—This invention relates to improvements in the construction of flat envelopes which are more particularly designed to be used for transmitting money and valuable documents safely by express and the mails.

CARRIAGE.—Francis Baker, New York City.—This invention relates to that class of carriages having low or half doors, and the invention consists in a novel arrangement of parts for supporting the glass or window frames therein.

HAY AND COTTON PRESS.—J. G. Roux, Raymond, Miss.—The novelty of this invention consists in two horizontal screws, located in a frame and connected to yielding levers, which are attached to the follower of the press in such a manner as to act powerfully on the said follower. These levers are acted upon by the screws in such a manner that when the greatest pressure is required, the levers are at a point where the screws have the greatest advantage and exert the most power.

TEASELING ATTACHMENT TO GIG MILLS.—Ernst Gessner, Aue, Saxony.—This invention relates to an attachment to gig mills, which is composed of a series of revolving disks covered with cards or other suitable material, which act in conjunction with adjustable guide rollers in such a manner that by the revolving motion of the disks and their position in relation to each other, the fiber of the cloth is acted on throughout the whole width of said cloth and under variable angles, and furthermore, the cards act uniformly and continuously on the surface of the cloth, thus raising the nap perfectly in a comparatively short time.

BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.—This invention consists in securing the stopper to the neck of the bottle, in such a manner that it can, when drawn out of the neck, be swung out of line with the same without detaching it.

GRIND STONE.—Warren P. Miller, New York City.—This invention relates to a grind stone which is composed of a number of blocks of grinding material, which are placed and held upon a cast-iron or other metal disk, in such a manner that they form a ring of grinding material, the face and not the periphery of which is to be used for grinding saws and other metal articles.

HORSE-SHOE MACHINE.—John W. Kingsbury, New Bedford, Mass.—This invention relates to a machine for forming horse shoes from cold bar iron, the machine being so arranged as to be adjustable for all sizes of horse shoes, and so that one shoe is formed during each revolution of the horizontal and driving shaft of the machine.

DEVICE FOR HOLDING CIGARS.—Charles Appel, Hoboken, N. J.—The object of this invention is to construct an apparatus into which a burning cigar can be laid when the same is not to be smoked, and which can then be placed into the pocket without injury to the cigar and without burning the pocket. The device will be of great value to smokers when entering cars or ladies' rooms, or other places where smoking is prohibited; they can then put the burning cigar into my improved holder where it will be extinguished, and can be used again whenever desired.

TEMPORARY RUDDER.—H. L. Stibbs, Savannah, Ga.—This invention has for its object to furnish an improved temporary rudder, so constructed and arranged that should the vessel's rudder become lost or broken, it may be readily and quickly adjusted in place.

CAR COUPLING.—J. Smith and J. F. Irvin, La Porte, Ind.—This invention consists in providing for drawing the pin from the coupling link, when the cars are to be uncoupled, by a slide which has a cogged rack attached to it, and in a pinion on a horizontal shaft which works in the rack.

SEED SOWER.—Elijah U. Scoville, Manlius, N. Y.—This invention relates to seed sower, by which all sorts of seeds from the coarsest to the finest can be sown, and which can be adjusted for sowing any desired quantity at once, so that the seed can be spread thicker or thinner as may be desired. The invention consists chiefly in the use of a revolving roller, which is arranged longitudinally below the seed box. For the circumference of this roller are arranged longitudinal grooves, which receive the seed from the hoppers in the seed box, and distribute it upon or against a revolving, zig-zag, wire seive spreader, by which the seed is struck and spread evenly over the surface of the soil.

ADJUSTABLE SELF-SHARPENING PLOW POINTS.—Mr. H. G. Hall, of Putnam, Ohio, has just patented a new and valuable point for plowshares, which can be removed and replaced at pleasure. The point is of chilled iron, cast on a shank of wrought iron, which fits into a dove-tailed recess cored in the share. It can be reversed, so that when worn on one side the other side may be presented for service. His invention comprehends also adjustable edges, to be changed at will. The device seems to add greatly to the durability of a plow, while it does not materially increase its cost.

CARD HOLDER.—H. H. Pember, New York city.—This card-holder is intended more especially for travelling trunks.

SEWING-MACHINES.—Robert Barclay, Buffalo, N. Y.—This invention relates to a sewing-machine, the presser foot of which receives an oscillating motion simultaneously with the feed wheel in such a manner that a rectilinear even and sure feed is obtained. The oscillating motion of the presser foot is effected by a cam which acts on a spring dog which connects with the presser foot, and which is adjustable by a set screw in such a manner that the feed motion of the presser foot can be regulated to correspond to the motion of the feed wheel. Said cam is mounted on the end of the shaft which serves to produce the motion of the needle slide, and it acts in conjunction with an additional cam, which serves to impart a rising and falling motion to the take up mechanism, the object of which is to take up the slack of the needle thread as the needle descends, so as to prevent the formation of a loop on the top of the material to be sewed.

HORSE HAY FORK.—H. H. Hatheway, Clockville, N. Y.—The object of this invention is to so construct and arrange a hay fork that it will operate easily, and that the tines will be prevented from coming into contact with beams or other obstructions.

SEED PLANTER.—D. H. Hull, Plantsville, Conn.—This invention relates to a seed planter which can be used for planting corn, cotton and other kinds of seeds, and which is so arranged that the plows and scrapers can be raised out of the ground with ease and facility, and that the same can be let into the ground to any desired depth.

SUGAR CANE STRIPPER.—S. Terry Hudson, Success, N. Y.—This invention relates to a device for stripping off the leaves of sugar cane, and consists in an arrangement of springs in pairs fixed upon a moveable stand support, which may be stuck upright in the ground in the field anywhere convenient to the cane, and shifted about as the leaves accumulate in stripping, so as to save handling them.

MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon, Va.—The nature of this invention consists in a new method of treating cast iron produced in an ordinary blast furnace for the manufacture of iron and steel of superior quality.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

P. T. L., says if you rub your finger on the outside of a glass lamp from the surface of the oil upward, a thin film of oil will appear to rise on the inside.

W. N. B., of Iowa.—The barrels of double barreled guns are so set that the shot from both barrels may strike the same spot. They are slightly inclined to each other toward the muzzle, and the lines of direction are intended to meet at the ordinary distance of firing. Shot gun barrels should be more inclined than rifle barrels.

G. W. M., of Pa.—Concrete is a mixture of mortar with coarse materials like gravel and fragments of brick and stone. When the concrete is to be exposed to water, hydraulic cement should be used instead of lime. Lime mortar may be mixed with cement in any proportion, but the hydraulic property of the concrete is lessened by the increased proportion of lime. Whether a concrete or stone wall should be used for a cellar and foundation would depend mainly upon the cost of material when the work is to be done. A concrete wall is not so durable as a wall of hewn stone.

R. F. W., of N. Y.—The spectacle lens you send is a genuine pebble *i. e.*, it was cut from a crystal of quartz. Such lenses are often designated by the locality from which the quartz was obtained as Brazillian, Scotch, Madagascar, etc. A genuine pebble lens will readily scratch window glass.

J. H. W., of Mass.—The water and steam in a boiler when the fire space does not reach above the surface of the water are at the same temperature.

P. D., of C. W.—The publication of your article on the Harrison boiler would provoke a discussion which would be neither interesting nor important to a majority of our readers.

L. T. R., of Conn., suggests that some ingenious inventor "fix up" a whistle to be operated by the wheels of the vehicle used by milk men, meat and other peddlers to announce their approach.

A. J. W., of N. Y., wonders that some genius does not invent a small hand blower to supersede the common bellows for family use. One operated by clock work, cheap and efficient, he thinks would sell like hot cakes.

N. D. H., of Pa.—The ordinary method of getting rubber into the form of sheets is to grind it up in a machine called a masticator. In this process the rubber is softened and made more plastic. In this condition it is passed between powerful rollers or callenders, from which it comes in a continuous sheet. Another plan is to spread a thick solution of rubber on a level surface, and allow the solvent to evaporate. Coal tar naphtha and light petroleum oil are suitable solvents. The rubber used in these processes must be raw or unvulcanized.

D. W. P., of Pa.—A good way to purify the mercury of your steam gages, which you say has become foul, is to wash it in a strong solution of sal soda, and then filter it through a cornet of paper, that is paper rolled up so as to make a narrow conical cup which shall have a very small opening at the bottom for the mercury to pass out. The mercury should be filtered several time until it is completely dry.

R. L., of Pa.—The specimen you send is specular iron ore. When pure it contains 69¾ per cent of metal. Your sample is slightly magnetic.

J. K., of Pa.—Fermentation of beer, and consequently the generation of carbonic acid, may be checked by cooling to near the freezing point. But the cooling will not destroy or decompose the carbonic acid already formed, as you appear to suppose.

G. A. H., of Pa.—The Ruhmkorff apparatus is simply the ordinary induction coil which is used for medical purposes, on a large scale. In a large apparatus the electricity has great tension and great care is required to secure insulation. The primary wire is only a few yards in length and is wound on a pasteboard tube. The primary helix is inclosed in a glass tube and upon the glass tube the secondary wire is wound The secondary wire should be one or more miles in length; fifty miles of wire have been used in a single machine. The secondary wire is covered with silk, and each layer is further protected by a coating of melted shellac. For experimental purposes the secondary wire is sometimes divided and wound in separate helices, so that a part or the whole may be used.

P. J. R., of Ohio, is not satisfied with what has been said on the question "why ice is slippery," and propounds the theory that ice is composed of smooth globular particles which are easily detached, and that a body sliding on ice rolls on these particles.

G. W. B., of N. Y., believes that the influence of the moon on the growth of plants is generally recognized, and has been informed that a man has retored his hair, which had become quite thin, by having it cut immediately after each new moon!

A M. D., of Mass., has a machine which has become so thoroughly charged with electricity that its operator is affected badly by it. Near the driving pulley is a 10 inch belt which travels 1,300 feet per minute and from which the electricity comes. The electricity may be taken off from the belt before it reaches the machine by arranging near it a series of metallic points which unite on a wire conductor leading to the ground.

E. S. G., of N. J.—A gas meter measures the gas by bulk only, and therefore when the pressure is much varied it does not register correctly. At high pressures the meter underestimates, . . . We have not heard of any water wheel which establishes a new principle in pneumatics.

B. F. W., of Ala., says he can get a hundred wagon loads of mica from the mountains at little expense, but it is not able to say that it is of commercial good quality. He should send a fair sample of it to some reliable chemist or mineralogist and ask his advice.

E. W., of Pa., is a miller and desires to learn how to rid himself of the first known as the pest known as the bolt eater. It is a black bug about half an inch long and destroys the silk bolting cloths, each of which is worth fifty dollars.

E. G. G., of N. Y.—There are many patents concerning mixtures of tar with gravel, sand, tragments of stone, etc., to be used for garden and other walks. It is not proper for us in this place to give a catalogue of the patents or to discriminate between their respective merits.

N. P., of Phila.—One of the best articles for destroying cockroaches are red wafers—scatter a few about the places where they most appear and they will eat them with a relish and soon die. The Persian insect powder is also a good article for the purpose but phosphorus paste is better than the latter.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Parties having a deposit of "mica" can sell by addressing W. W. B., 26 Holliday street, Baltimore, Md.

Flax Mill Wanted at Coloma, Ill. See advertisement and address A. P. Smith, Sterling, Ill.

Molders' Tools, Surface Gages, etc. (Manufacturers of), send price list to "Traveler," Box 143, Grand Rapids, Mich.

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The Great Mormon Tabernacle at Salt Lake.

Our engraving presents the commencement of the structure, which has since progressed so far towards completion as to have the bents upon both sides added, and to be largely covered in. By it a correct idea may be had of the enormous size of the building, and the mechanical difficulties attending the construction of so ponderous a roof. The credit of carrying on such a vast work can best be appreciated when it is borne in mind that the timber is brought from a considerable distance, and other materials imported from the States.

This building was not constructed with any view to display architecture, but merely as a temporary meeting place for the people to assemble, and to take the place of the old Tabernacle and Bowery, the former of which was a large building, and the latter simply a huge shed covered with green boughs. Inside of the Tabernacle an organ is now constructing, second in size to none in the United States except the celebrated one in Boston.

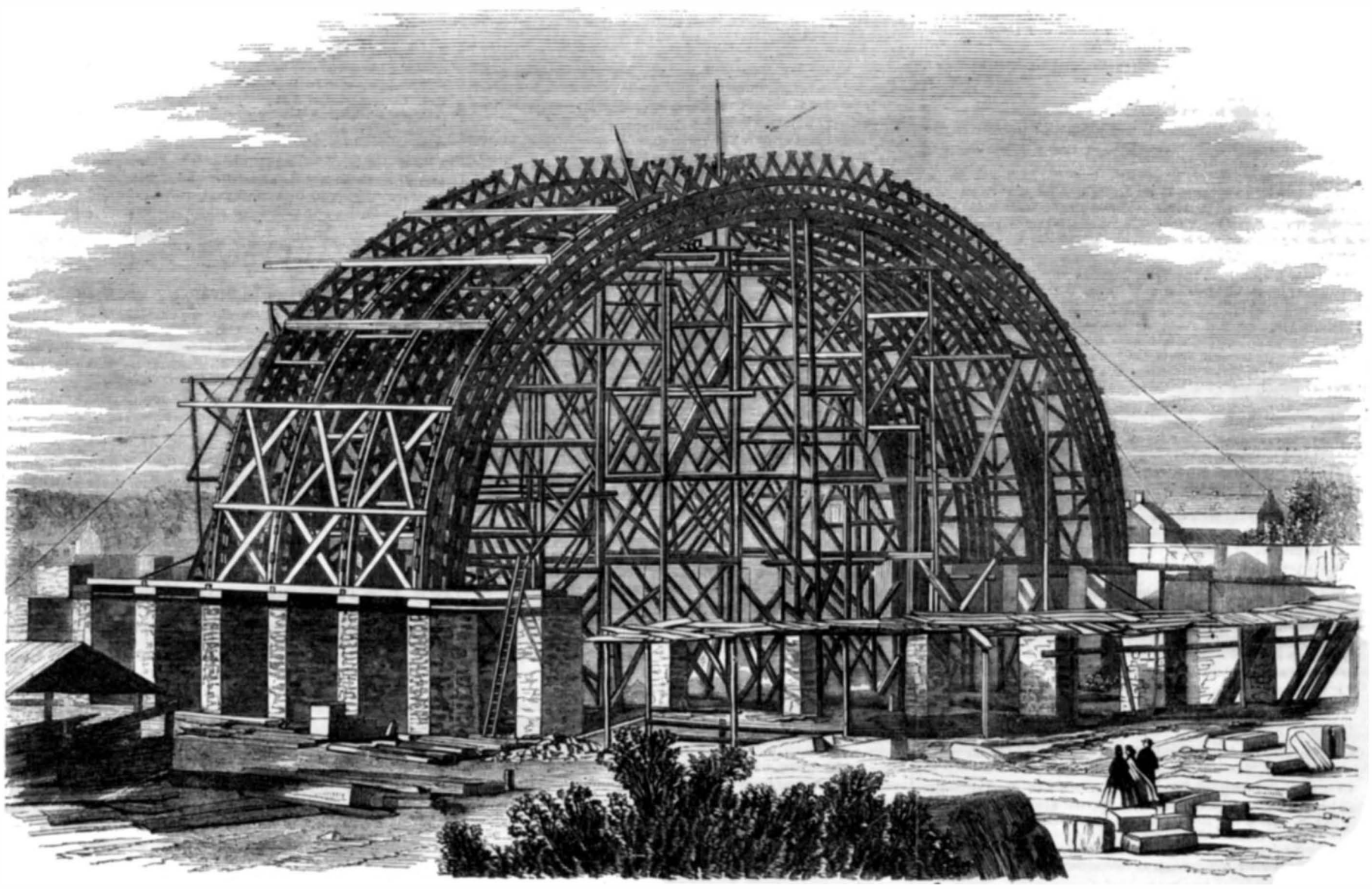
Our readers must not confound this edifice with the great Mormon Temple, which is a far more elaborate structure, of cut granite, erecting not far from the Tabernacle, and more slowly progressing. The granite is brought from a distance of about ten miles, and the blocks are so large in size, and the quantity so great, that a canal is being built to the neighborhood of the quarry for transportation of the material.

The Tabernacle is in the form of an ellipse, with an extreme length of 250 feet, and width of 150; extreme hight of roof 78 feet; hight of ceiling 68 feet. The immense roof frame rests upon 44 cut stone piers, about 12 feet apart and 20 feet in hight, which gives 48 feet of spring to the arch. The 44 bents, or principal rafters forming the arch are composed of 6 thicknesses of 2½ inch plank, framed like lattice work, strongly pinned and bolted, and tied together by 15 horizontal cross timbers on the outside, upon which the smaller rafters for the sheeting will be laid, and 15 similar cross timbers inside, to which the ceiling joists will be stayed. The 13 half bents, resting upon the 13 piers, in curve, at each end, join diagonally upon the apex of the arch of the two outside parallel bents.

The stand will be in the west end; the floor to be laid level for a distance of 60 or 70 feet in front of the stand, thence gradually raising to the east end, where the seats will be level. It is estimated that the house will seat about 10,000 persons.

But, large as is the extent provided for the accommodation of the people in the above building, it is now feared that it will be too small and that further accommodations will be necessary. For freedom of egress, a very material consideration where large audiences are concerned, ample provision has been made in the folding door appointments of the entire space between the 9 piers in line on either side.

A cornice, 8 feet deep, will ornament the stone work. In the majestic, towering, self-supporting roof of this building, there will be consumed nearly 1,000,000 feet of lumber. When finished it will present the appearance of a ponderous half globe, with sides slightly compressed, and although of a



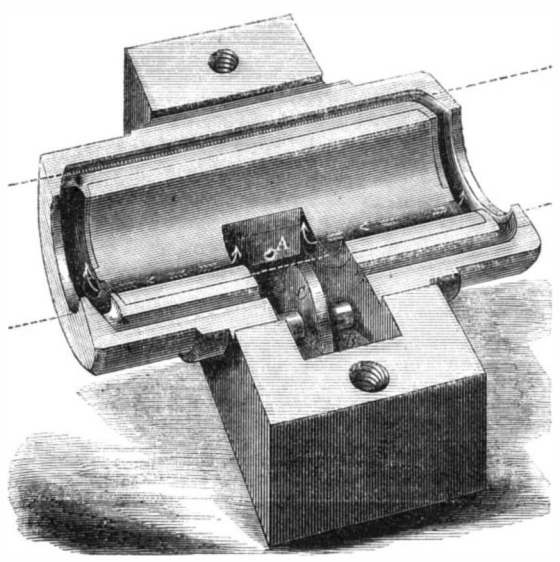
THE GREAT MORMON TABERNACLE AT SALT LAKE.

Sweet's Matrix-Printing Machine.

The principle of this ingenious American invention, which excites so much interest at the Paris Exposition—having even been elaborately described and illustrated in the *Engineer*—is the arrangement of a complete alphabet of steel types radially upon a vertical wheel, with apparatus for bringing any type at pleasure, by the revolution of the wheel, into vertical position under the center, and there pressing it downward to the precise and uniform depth chosen for the matrix. The impression is made upon soft thick paper prepared for casting upon, which is fed forward by mechanism, the precise breadth of each letter brought into play. The transition from the end of one line to the beginning of the next is provided for in a similar way. The process is subject to the inconvenience of a calculation to be made beforehand upon every letter and word of the copy, to see just what spaces must be introduced between the words in order to fill each line with precision, since the line cannot be "justified" if unequal, after being imprinted.

MORRIS' SELF-OILING BOX.

The box seen in the engraving was patented through the Scientific American Patent Agency, Jan. 1, 1867. It is a device for lubricating the journals of shafting, by means of a reservoir in the body of a box and an arrangement of parts for distributing the oil to the shaft. It is not expensive in construction and appears to be very effective in operation. By reference to the engraving it will be readily understood. The engraving shows only the lower part of a stand box, as the cover does not materially differ from those in ordinary use, except in a particular hereafter to be mentioned. Hanger boxes can be made with the peculiar devices shown in the engraving as well as stand boxes.



A is a reservoir for the oil, cast in the box, having an incline toward one side on which rests a flat slotted spring, B, which supports the pivots of the disk wheel, C, the body of which projects through the slot so that its surface turns in the oil. As the shaft revolves the wheel turns by its slight pressure upon the shaft, shown by the dotted lines, and brings the oil to the surface of the shaft. Any superabundance of the oil is deposited in the longitudinal channels in the face of the box, which communicate with end channels conforming to the contour of the box. From these end receptacles passages lead under the lining to the central reservoir. The direction they take is shown by the arrows, and their apertures are seen at one end and in the center. The cover has end passages or channels corresponding with those in the box and an oil hole over the outer portion of the rim of the roller, C.

It will be seen that a continual circulation of the oil is kept up and that no oil can escape from the box to be wasted. With this device drippers to hangers are unnecessary, and the journals will run for months without being oiled.

Further informatiou relative to this box can be obtained of the patentee, Geo. M. Morris, Cohoes, N. Y.

Ericsson and the British Navy.

An English journal which champions the cherished broadside system of the British navy, having attempted to weaken the influence of Bourne in favor of the monitor system by insinuating that he was an agent for Capt. Ericsson, Mr. Bourne has published certain correspondence showing that Ericsson at his solicitation had consented a year or two ago, to give the Admiralty any advice that might be desired in the construction of turret ships. Having failed however, to induce the Admiralty to act in this direction, the matter dropped. The following is the concluding portion of Mr. Bourne's last letter to the Secretary on the subject:—

"In now notifying to you Captain Ericsson's acquiescence in this decision, I may be permitted to express my regret that their lordships have not been able to render available for the public interests the talents and experience of one of the most remarkable men of the present age, and his assent to my proposal that he should give the Admiralty the benefit of his information, I thought it a matter of some importance to have obtained, especially as he was willing to act without emolument or conditions, both his reputation and his wealth rendering him independent of such considerations.

"I have the honour to be, etc.,

J. BOURNE."

"London, May 30, 1866.

THE HAMMOND RIFLE—A new American breech-loader—receives very high encomiums in England. The British Government, which has adopted the Snider conversion for the Enfields, pending a mature and final selection, have ordered a competitive trial of all patterns, and the *Mechanics' Magazine* predicts that the Hammond rifle and the Daw cartridge will be formidable competitors among the 93 which the Commission already have before them.

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NEW YORK, SATURDAY, JUNE 8, 1867.

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ANOTHER NEW AND REMARKABLE TEXTILE.

It will be pleasant indeed to find the enthusiastic anticipations of M. Benito Roezl, of the eminent French naturalists, Blume, Decaisne, and others, and of Mr. A. B. Bacon, chairman of the Section of Agriculture, New Orleans Academy of Science, realized in respect to the *Ramie* or Boehmeria tenacissima, of Java. From the nature of the case, anticipations so high must seem extravagant, and be held subject to extra hazards of disappointment, until their actual accomplishment leaves no place for conjecture. From a communication by the last-named gentleman to the Academy of which he is a member, we learn that at present the exotic is introduced and flourishing in a large plantation in Mexico, and that the conviction of the naturalists who have nursed it and experimented upon it for the last twenty-three years, that its fibre is stronger than hemp, as fine and white and twice as durable as linen, and more productive than cotton, is so far confirmed that in 1865 M. Roezl exported and sold in England over 5000 lbs. of the staple at double the price of the best quality of cotton. Its beautiful fabrics will be displayed in the Paris Exposition, but we have as yet received no account of them.

The Ramié belongs, like the hemp and the nettle, to the *urticaceæ*, and was transplanted from the island of Java to the Paris Jardin des Plantes, by Blume, in 1844, where it was reared in the hot-house until its introduction into the more congenial climate of Mexico by M. Roezl, former head of the Horticultural Institute of Belgium, within eleven years past. It is considered that only the middle and southern portions of our Gulf States will afford it a suitable climate, and that in that latitude it will make three or four crops a year, each equal in quantity to the most prolific of hemp.

The perseverance of Mr. Roezl in domesticating the staple in the western world has been almost romantic—perhaps we should say heroic—and richly deserves the high reward his friends anticipate for it. Having first gone to Java and spent a year in familiarizing himself with the character and growth of the plant, he emigrated to Mexico with a store of its roots. On his way to the capital he was robbed of his treasure by the Mexican banditti, who took little benefit from their crime, and was obliged to write to his friends in Europe for a new supply, which was at length procured through the good offices of the British navy: but this perished on the voyage to England. Again it was attempted, and again the plants were killed. A third attempt succeeded, but the plants had to be placed under hot-house cultivation in England, to give them strength for another great voyage. At last, in 1859, after six years of waiting and endeavor of this kind, his plants arrived half dead, and with the skill of an accomplished and scientific horticulturist he nursed them successfully into life, and within two years found himself the owner of a thriving plantation.

This was but raw material, and the least part of the difficulties had been overcome. He imported from England the most approved machinery for cleaning flax and hemp, but it proved unsuited to the requirements of so fine a fibre. Two years of effort in this direction were spent in vain, when he fell back upon his own tireless resources, and in two years more produced two inplements of his own invention by which the stalks were converted within twenty-four hours after cutting, into long skeins of pure, white and silk-like fiber, ready for spinning. In February last, Mr Roezl visited Cuba with specimens of the results of his eleven years labor, which after careful examination were pronounced of the first importance by the naturalists and agriculturists of the island, who predict that it will supplant tobacco and coffee as a preferable staple for Cuba. Mr. Roezl takes five crops per annum from his plantation, the matured plant, which is perennial, attaining when well rooted the hight of twenty feet.

CONDITION OF THE PATENT OFFICE.

Nearly two months ago, in announcing the passage by Congress of a bill to increase the examining force of the Patent Office, we commented as follows:—"The Commissioner is now clothed with ample authority. We understand that he intends to fill all new positions by promotions, which is certainly very commendable. We earnestly hope that the Commissioner will act promptly and energetically in carrying the new measure into effect. The business of the office is suffering very much from the delay which attends the examination of cases, and now that the Commissioner has the power, we hope that he will employ it to infuse new life and vigor into the Department."

We have yet to learn that the Commissioner has made a single new appointment or taken any active measures towards bringing up the back work of the Office. Hundreds of applications are awaiting action, some made six months and more ago. Inventors are getting discouraged, and everybody who has business transactions with the Office is disappointed that the Commissioner does not avail himself of the authority vested in him by Congress to increase his force. In some classes the examinations are closely up, but in others they are several months behind. This condition of things should not exist, and with the power ceded to the Commissioner by our last Congress, there is no occasion for it. Wake up! Mr. Commissioner: inventors are busy, applications for patents never were greater, the treasury of the Office is plethoric, and now all that is wanted to make the Patent Office the most prosperous department under Government is a vigorous administration.

MODES OF WORKING WOOD.

So much of the public attention has of late years been directed to the new preparations and applications of the metals, particularly iron and steel, that the merits of that old time friend of man civilized as well as savage, wood, are likely to be overlooked. Volume after volume is issued from the press, and our periodicals are filled with articles devoted to the properties, qualities, uses, and manipulations of the metals, while those which treat on wood are few and far between. Still, it would be difficult to imagine, in our present state of advancement, where to look for a substitute which should combine so many qualifications of usefulness and such adaptability to diverse manipulation.

Besides the hundred applications of cutting, splitting, and sawing, wood can be worked in many more ways. It is doubtful if any substance with which we are acquainted is suceptible of so many radical changes—changes which alter the very structure of the material and adapt it to the most opposite uses. It can be torn into fibrous shreds which make elastic cushions or beds; made into a spongy, porous mass; hardened by chemicals which change its texture and make it semi-mineral in nature; compressed by mechanical means, closing its pores, until it is nearly as compact as the metals. It may be molded into various forms; bent to keep its enforced position; dissolved into pulp and made into paper; separated into *laminæ* by percussion, and, in short, treated in any conceivable manner except melted and cast.

Perhaps one of the most interesting of the methods of working wood is that of separating one layer from another by percussion, or by compression joined to bending. Those woods only can be treated in this way which grow by external concentric accretions, as many of our hard wood trees. The wood for this treatment should be tough, elastic, and straight-grained.

The Indians of this country, and the basket makers in others, separate the layers of the wood by beating upon the surface of a log with heavy mallets, when the wood comes off in thin *laminæ*. This method of disintegrating wood is one of the oldest of human arts; probably no mode of working wood is older. What was formerly done by hand is now, however, performed by machinery. We saw the other day, in Jersey City, machinery which performed this work in a remarkably rapid and effective manner. It was run by the Wilder Hoop Machine Company, and was designed for making (rolling) hoops of wood from a "bolt" split from a log. The wood used was black ash, although any tough, straight-grained wood would answer. The bolt was a longitudinal cleft the cross section of which might approach either a parallelogram or a triangle. One end was presented to a space between two swiftly-revolving heads armed with cutters which almost instantly formed a wedge-shaped point, then to another disk with thin cutters which splits the V-shaped end at intervals corresponding with the thickness of the hoops to be made. These splits do not extend more than one or two inches from the end. The bolt is then run between circular saws and trimmed to nearly a square form, or to a parallelogram, one side of which corresponds with the width of the hoops.

Then the bolt is passed between upright corrugated feed rollers held in contact by powerful springs. Directly behind these were a set of smooth rollers, placed horizontally, between which the bolt passed, being compressed powerfully, and by means of a curved guide compelled to take a short curve. The result was a splitting from end to end of the bolt, forming perfect hoops, or rather slips of equal thickness throughout. The philosophy was not difficult to understand. The slits cut in the end of the bolt were starters for the thickness of the splits. The wood, being wet, yielded to the compression of the rollers, and the direction given the bolt by the curved shoe compelled one piece to slide upon another sufficiently to divide the cross fibers and insure a separation. The whole process is a very brief one, occupying no more time probably than would be spent in reading this description. It is very interesting and gives the observant man new ideas concerning the capabilities of wood. That its fibers can be cleanly separated, simply by compression and bending, to make as smooth a job as if sawed, and preserve the longitudinal grain and consequent strength as perfectly as if split by ordinary means, is at least surprising.

THE GULF STREAM AND THE CUBA TELEGRAPH.

A special survey has been made under the direction of the Acting Superintendent of the U. S. Coast Survey, Mr. J. E. Hilgard, at the instance of the International Ocean Telegraph Company, with a view to determine the conditions to be encountered in locating the cable between Florida and Cuba, through the Gulf Stream. The examination reveals a very irregular and precipitous descent from the Cuban coast, reaching the maximum depth of the channel, 843 fathoms (say 5,000 feet) 37 miles from the Moro. From the northward, the bottom falls away in terraces without abrupt slopes. It is in the deep canons or gorges of the southern portion that the Gulf Stream and its counter currents find their channels; while the sea lies almost motionless above the terraces of the northern coast. About 21 miles from the coast of Cuba, a submarine mountain rises in the midst of the southern channel, with the extreme depths of 748 and 843 fathoms on either side of it. The summit of this mountain is 2,400 feet above the bed of the straits and reaches to within 2,400 feet of the surface; the current running over it so strongly that soundings were made with great difficulty. It appears to be triangular in its general form, with precipitous sides, presenting at its west angle a bold prow to the stream.

Assistant Henry Mitchell, from whom these data are derived, states that the observations indicate the depth of the Gulf Stream to be scarcely more than one-third the maximum depth of the channel. He concludes that the Gulf Stream is not a profound movement, but an overflow of water from the Gulf, having for its office the restoration of surface level, while the office of the counter stream, or "polar current," beneath, is the restoration of equilibrium thus disturbed between waters of different specific weights or densities. This view of compensating currents is illustrated by observations in the Hudson river. In the dry season (July) the surface outflow of the river through the Narrows has been found to occupy three-fourths instead of half the twelve tidal hours; while in the under stratum the case is more than reversed, and the inflow predominates to such an extent that as a general thing it is constant along the bottom, although not in velocity; and the same conditions with variable proportions, obtain for some distance up the river. On running a line of levels from New York to Albany, it was found that the bed of the Hudson river lies below the mean level of the sea for over a hundred miles, while the surface of the fresh water, or river proper, in the dry season, is above this level, yet not so much above as to counterbalance the excess of specific gravity in the sea water, which consequently during the summer months flows in along the bed of the stream, while the fresh water overflows into the ocean. In other words, the Hudson, for one hundred miles, is in the summer but an arm of the sea analogous to the Gulf of Mexico, deriving much of its elevation as a stream, from a like cause with that of the Gulf stream, viz: its lightness, lifted above the sea level by the bottom pressure and inflow of the heavy sea water in the opposite direction.

The striking variations in the velocities of the Gulf Stream, which were particularly remarked by navigators during the late survey, the weather being exceedingly calm, are accounted for on the hypothesis that they follow the changes in mean sea level which depend upon the declinations of the sun and moon—more especially the latter. Prof. Bache has shown that the mean level at Key West is one foot higher when the moon is in the equator than when she is at her greatest declination; while, on the contrary, in the North Atlantic the mean level is about three inches higher at her *maximum* declination: giving a variation of fifteen inches in level to account for the variations in the velocity of the stream.

THE PRICE AND PROSPECT OF BREAD.

We have remarked the extraordinary phenomenon of breadstuffs going from east to west instead of west to east, and even from Europe to America in a few exceptional instances. The fact is that there is more flour and wheat at the east than at the west, and although the stocks on hand in New York are much larger than last year at this time, while large shipments are made from California, those in the west are much more than proportionally smaller, and prices equally high; so that the aggregate of breadstuffs in the country is evidently reduced enough to fully account for the present enormous prices. Among the causes of scarcity are the short western crops of last year (resulting partly from a scarcity of labor which the war has left as a melancholy memorial of its carnage) the half extinct agriculture of the South, and its heavy drain upon the northern markets. The anticipated crops, rich as their promise is, cannot therefore exert their natural effect upon prices, and will not begin to replenish the market at all under two months. But before that time, if no new calamity or portent intervenes, the coming harvests will cast their shadows before, and discourage the extortion of speculators materially. When they are fairly in the field, it may be rationally hoped, the prices of food will come down to a more reasonable scale than has been known for years. The most cheering accounts of the wheat prospect pour in from every section of the country. The South has devoted an unprecedented proportion of land to food, and the crops promise unusually well, while in the West, the mighty tide of immigrating labor has filled up the ghastly chasm left by the war, the high prices have

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produced a great increase in the breadth of land sown,—in some regions nearly double—and Providence has smiled upon the buried seed and the tender blade. The deep snows of the winter have protected the wheat, and from every section comes the report that it is growing magnificently and promises a glorious yield, far surpassing in the aggregate any crop ever before raised in this country. The Puritans of New England, taught by hunger to feel their dependence on the God of nature, used to fast and pray one day in every spring, for a blessing on their hard fields, and their descendants keep up at least the form in the New England states to this day. Our crops have yet to run the gauntlet of many foes, and may the Providence whose bounty we have seen so marvellously enlarged in modern years, still regard mercifully the wants of our toiling millions, and "God save the wheat!"

The report of the Agricultural Department for April says: "Never has there been so general an expression of encouragement in view of the fine condition of winter wheat since the establishment of the present system for the collection of crop statistics. In more than nine tenths of the returns received, the condition of the crop is reported favorable and promising. From the South the returns are as cheering as from the West. The report states, however, that the loss of cattle from starvation and exposure the past winter has been extraordinary. Beef is not likely to be any cheaper.

GLEANINGS FROM THE POLYTECHNIC ASSOCIATION.

Dr. Feuchtwanger showed a specimen of tellurium, an exceedingly rare substance commonly classed among the metals but which has much analogy in its properties to sulphur and selenium. The French call this substance one of the metalloids. In its native state the ore is found combined with iron, gold, or silver. Its color is silvery white and brilliant, and in appearance it closely resembles antimony. It is found in the Altai mountains and in Transylvania. The specimen shown was found in a gold mine of California.

Mr. Fisher exhibited drawings for a steam-plowing machine or more properly a pulverizer. The machine resembles a locomotive with a short boiler, and mounted on wide tired wheels. The power is applied to drive a drum having circular saws thereon set three inches apart. By suitable gearing the engine advances slowly while the drums rotate with great rapidity, pulverizing the soil to the proper depth. The subject of steam plowing being thus introduced, its importance was acknowledged by all, but an animated discussion sprung up respecting the relative advantages of employing traction engines working the plows directly, or stationary engines working the plows by means of chains, as is the common custom in England. Both methods had their advocates who warmly argued their respective merits. It was claimed on one side that the traction engine beats down the field in front of the spaders which it afterward is made to plow up, as the wheels must be made wide enough to prevent the machine from sinking into the ground.

Mr. Parmelee read a paper on gypsum, describing its nature, and referring more especially to its use as a fertilizer. Its value in this respect he asserted was owing to its absorptive power in taking in ammonia from the atmosphere and storing it up to be disseminated by the rains through the fields.

President Tillman gave the club the results of some experiments he had witnessed at the works of the lead encased block tin pipe company, showing that this pipe possessed the same strength as that of lead pipe of twice its weight. He also referred to the dangerous effects from using water drawn through common lead pipe, and advocated the passage of a law which would prevent its employment in this capacity. He was followed by several members speaking on the same subject, describing minutely the action of the poison and its different effects. Some persons are more susceptible to its injurious consequences than others, as is well known to be the case in regard to painter's colic and kindred complaints.

Mr. Walling repeated the beautiful experiment lately performed by Prof. Thompson of Edinburg before the Royal Society of Scotland, and described in the article on "wirbel bewegung" on page 212, current volume. These air vortexes are very frequently produced in nature and are made visible when smoke or steam is mixed with the whirling air. They may be seen when cannon are fired, particularly if the muzzle is "slushed" with grease, also as issuing from the smoke stack of a locomotive just starting: human smokers constitute perhaps the largest number of experimenters in this line. Mr. Walling remarked that the molecular theory based upon this phenomenon by Prof. Thompson, was an indication of the tendency of scientific opinion towards some such purely dynamical theory as had been previously proposed by himself.

Tin Lined Pipe for Water.

On Thursday the 23d of May an exhibition of the method of the new manufacture of lead pipe lined with block tin was given at the manufactory of the inventors and manufacturers, foot of west 27th street, New York. The visitors invited had an opportunity to witness the processes from the first casting of the core of tin to the production of the pipe in its finished state, and the sentiment was general that it was a complete success. We have no time nor space in this issue to describe the processes, nor to state the facts established by the experiments. In our next we shall endeavor to show the immense advantages of this over the ordinary water pipe.

THE hardware manufactory of Sargent & Co., New Haven, Conn., gives employment, at its full capacity, to 800 hands, and turns out 4,000 different articles of hardware to the amount of $4,000,000 to $7,000,000 per year.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING MAY 21, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

64,826.—DEVICE FOR HOLDING CIGARS.—Charles Appel, Hoboken, N. J.

I claim, as an improved article of manufacture, a cigar holder consisting of a combination of the shells, A B, with the cutter, d, the latter either being attached to one of the shells or being part of the same, all made and operating substantially as and for the purpose herein shown and described.

64,827.—LIME KILN.—George Atkins, Sharon, Pa.

I claim the arrangement of the lime kiln formed of the chambers, A B D, and heated by furnaces, C C', at different levels inside the kiln, operating substantially as and for the purpose herein described.

64,828.—HAY PRESS.—George H. Aylworth, Brighton, Ill.

I claim a hay press, consisting of the box, a, and the sliding partition, k, operated by means of the screws, c b, the whole constructed and arranged as herein shown and described.

64,829.—CARRIAGE-WINDOW FRAMES.—Francis Baker, New York City.

I claim a carriage-window frame swiveled or pivoted to uprights, F, arranged to move in and through the carriage body, and bent springs, K or L, hooks or catches, N, and studs, I, substantially as and for the purpose described.

64,830.—SEWING MACHINE.—Robert Barclay, Buffalo, N. Y.

I claim, First, The sliding rod, q, situated between the needle slide and tension device, t, in combination with the needle operating shaft, E, and cam, r, the whole arranged and operating as and for the purpose specified.

Second, The combination and arrangement of the adjustable pivoted dog, m, slide, o, and lever, G, in combination with the presser foot, D, constructed and operating substantially as and for the purpose set forth.

64,831.—LIQUID FOR CARBURETING GASES.—John A. Bassett, Salem, Mass.

I claim the hydrocarbon liquid for carbureting gases, produced by the combination and process described substantially in the foregoing specification.

64,832.—PEAT MACHINE.—Alfred Bridges, Newton, Mass.

First, I claim the arrangement of the sleeve, C, passing over stock, D, in the manner and for the purpose described herein.

Second, The adjusting plunger, E, by means of projection, d, and spring, C, or its equivalent, as above specified.

64,833.—RAILWAY SWITCH.—James S. Brothers, Duncannon, Pa.

I claim the construction of the chair, K, with the adjustable frog, G, when arranged, combined, and operated as herein described and for the purpose set forth.

64,834.—QUARTZ MILL.—Samuel C. Bruce, New York City.

First, I claim the revolving wheels, C and D, with velocities varying in some regular ratio, so that wheel, D, shall always revolve faster than, and in the same direction as, wheel, C, and for the purpose described.

Second, The arrangement of wheels, C and D, revolving in the same direction, in separate but communicating cases, A and B, and so constructing said cases and arranging them with reference to said wheels and their shafts that the external air can enter at aperture, E, only in the periphery of the case, A, substantially as and for the purpose described.

64,835.—SAW SET.—Benjamin N. Butcher, Philadelphia, Pa.

I claim the combination of the bed plate, A, with beveled edges of different angles of inclination, and the reversible and adjustable guide pieces, E and E', set screws, F and G, and sets, C D, substantially as and for the purpose set forth.

64,836.—CANE AND SORGHUM STRIPPER.—James A. Campbell, Stow, Ohio.

I claim, First, The rollers, G H, arranged substantially as shown and described, in connection with the stationary cutter or stripper, L, and the yielding or pressure cutter or stripper, M, having the lever, N, and spring, O, applied to it, substantially as and for the purpose set forth.

Second, The rotary topping cutter, Q, attached to wheel, R, in connection with the concave plate, S, all arranged to operate in connection with the stripping device, substantially as shown and described.

Third, The combination of the endless leaf and top-discharging apron, B, with the leaf-stripping and stalk-topping mechanism, substantially as and for the purpose herein set forth.

64,837.—PORTABLE SEAT FOR DRIVERS UPON CARS.—James F. Campbell and Cornelius Finney, Williamsburg, N. Y.

We claim the upright or staff, B, with hook at one end, and provided with a rod, E, having seat, G, and strap, H, substantially as and for the purpose described.

64,838.—BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.

I claim the slide, F, carrying stopper, in combination with the swiveled loop, E, in which it moves, substantially as and for the purpose described.

I also claim, in combination with the above, the swinging clasp, I, substantially as described for the purpose set forth.

64,839.—WHEEL PLOW.—Elisha A. Chace, Rosemond, Ill.

I claim a wheel plow, having the stationary frame, A, pivoted frame, F F' F', plow beam, D, and elevating devices, G G1 G2, arranged to operate substantially as and for the purpose described.

64,840.—CLOTH-GUIDE FOR SEWING MACHINES.—George F. Clemons, Springfield, Mass.

First, I claim in a cloth guide for sewing machines the employment with a cloth gage of a rigid guide plate, adapted to bear upon the cloth in front of the sewing needle, and extend across the line of seam being sewed, and having elastic and adjustable pressure given to it, in such a manner as that it shall press more upon the cloth outside the seam than inside thereof, and thereby guide the cloth towards the gage face.

Second, The elastic plate, b, either with or without the rigid guide plate, a, combined with the pressure plate, e, screw, f, and gage, c, substantially as described and for the purposes set forth.

Third, The rigid guide plate, h, combined with the elastic plate, i, screws, j j, rigid plate, k, and gage, l, all with or without the link, n, substantially as described and for the purposes set forth.

64,841.—DEODORIZER FOR PRIVY SEATS.—Neil Clifford and A. N. Bell, Brooklyn, N. Y.

We claim the combination with the seat of a privy, water closet, or other similar place of whatever name called, of a receptacle or vessel for the reception and holding of any suitable deodorizer or disinfectant, whether in the form of a liquid or powder, when such vessel or receptacle is so constructed and connected with the seat board that by the depression or upward movement of the seat, or both, the said disinfectant or deodorizer will be discharged into the vault of the privy, etc., substantially as and for the purpose described.

64,842.—LOCOMOTIVE ENGINE.—Joseph M. Coale, Baltimore, Md.

I claim in combination with locomotives and other similar boilers, the additional sheet, d, and flues, f, for the purpose of preventing the cold air from chilling the ends of the flues proper, substantially as and for the purpose set forth.

64,843.—RAILROAD RAIL FASTENING.—John Cochran, Wall Township, N. J. Antedated May 13, 1867.

First, I claim the combination of a screw bolt or wood screw spike, with a cleat that has a bearing upon the top and at the edge of the rail flange, and also upon the cross tie, and so constructed or formed that it can be removed from the flange of the rail upon slackening up the screw bolt or wood screw spike by which it is secured to the cross tie, substantially as herein described.

Second, The heel spurs of the cleat for entering into the timber or cross tie, so as to hold against the lateral thrusts upon the rails, as caused by the action of the wheels of passing trains, in combination with the screw bolt or wood-screw spike fastening of such cleat, substantially as herein described.

Third, The peculiar construction of the cleat, by reason of which it may be made by pressure or percussion from flat iron bar, complete in all its parts, without necessarily altering the thickness of the material in any of such parts, substantially as herein described.

64,844.—STEAM GENERATOR.—S. M. Colburn (assignor to himself and Sylvester Colburn), Ansonia, Conn.

I claim the plate, B, constructed and arranged within the boiler, so as to form a chamber, C, communicating with the boiler by means of openings or perforations, a, substantially as and for the purpose set forth.

64,845.—MANUFACTURE OF GAS.—Joseph H. Connelly, Wheeling, West Va.

First, I claim the use of lime obtained from burnt limestone or oyster shells, dampened or slaked with water, salt, or saltpeter solution, introduced into the retort as described, in the proportion mentioned, for the purpose of whitening and desulphurizing the gas, as set forth.

Second, The use of lime prepared as stated, in combination with coal and residuum oils, introduced as described for the purpose specified.

Third, The combination of lime, prepared as stated, and cinders, coke, coal, or wood, with residuum oil alone, for the purposes mentioned.

Fourth, The use of residuum oil alone, in combination with lime, for the production of inflammable gas, desulphurized and whitened in the manner set forth.

64,846.—MEANS FOR STEERING VESSELS.—Robert Creuzbauer, New York City.

First, I claim, in combination with a steering screw, or its equivalent, arranged within a pipe or water way extending transversely through the hull of a vessel, a means which will enable the pilot to give a right or left motion to said screw or to stop or start it at pleasure without stopping or reversing the motion of the driving power, substantially as described.

Second, The combination of a steering screw or its equivalent, arranged within a water way extending transversely across the hull of a vessel, with a means which will enable the pilot from the pilot house to stop, start, or reverse the motion of an engine, which is used for rotating said screw, substantially as described.

Third, In combination with a steering screw, arranged to operate substantially as described, I claim the employment of an engine for rotating the screw, and a means for rotating the screw when the engine is in operation substantially as described.

Fourth, Providing for disconnecting the capstan shaft, F, from the screw shaft, d1, when this latter shaft is connected to and driven by the engine shaft, d2, substantially as described.

Fifth, The combination of the capstan or capstans upon shaft, F, with the gearing, E f f', clutch, g, lever, G', shaft, d', and with an extension, d2, of shaft, d', clutch, W W', and a driving engine, substantially as described.

64,847.—KEEPER FOR DOOR LOCKS.—George W. DaCunha, of New York city.

I claim an improved catch or nosing for door locks formed with a flange, d1, to project along or be led into the jamb, and with a flange, d2, to project along the casing, said flanges being cast solid, with and forming an integral part of the side catch, substantially as herein shown and described, and for the purpose set forth.

64,848.—HAY LOADERS.—Leopold De Lacee, Springfield, Ill.

First, I claim the revolving platform and raking device, D, composed of the frame, a, fitted in the main frame, A, and provided with the bars, E, having teeth, F, attached, all arranged substantially as and for the purpose specified.

Second, The raking and pitching fork, S, attached to a carriage, P, operated by an endless chain, Q, and arranged with ways or guides, j j, on a suitable framing or support, substantially as and for the purpose set forth.

Third, The swinging or pendant frame, T, in combination with the lever, I, bar, H, and clutch pulley, G, arranged to operate in connection with the revolving platform and raking device substantially as and for the purpose specified.

Fourth, The two pulleys, G G', connected by a clutch, and arranged as shown to operate respectively the revolving platform and raking device, and the raking and pitching fork substantially as shown and described.

64,849.—PLANING MACHINES.—William H. Doane, Gerritt V. Orton, and William E. Loudon, of Cincinnati, Ohio, assignor to J. A. Fay & Co.

First, We claim the combination of the adjustable break irons, k' k', with the cutters, k k, and the removable collars, h h, all constructed and arranged in the manner and for the purpose described.

Second, The application of the shield, G, to a post, m, which is allowed to revolve around the cutter head substantially as described.

Third, Sustaining the safety shield, G, upon the table top, A, by means which will admit of said shield being moved around the axis of the cutter-head, and also adjusted vertically substantially as described.

64,850.—WHEEL VEHICLES.—James W. Drew, Stockbridge, Mich., assignor to J. N. Townson and James W. Drew, Antedated May 16, 1867.

I claim the crooked sway bar, H, and the cross bars, I and J, in combination with the axle, C C, and the axle guides, G G, the whole constructed and operating in the manner and for the purpose herein described.

64,851.—COCKS.—Charles M. Alburger, (assignor to George R. Kirk), Philadelphia, Pa.

I claim the follower, A, having its metallic packing, E, and elastic packing, e, and elastic packing, e', in combination with the spring, D, flanged thimble, F, packing, E, and spigot, C, substantially as described for the purpose specified.

64,852.—CONVERTING RECTILINEAR INTO ROTARY MOTION.—James A. Ehle, Green Bush, Wisconsin.

First, I claim converting rectilinear motion into rotary motion by the use of polygons, substantially as described.

Second, The balanced lever, B, the connecting rods, C C, the carriages, D, and the guides, E, substantially as described and for the purposes herein set forth.

Third, The pins, f, forming hooks upon the triangles, E, and the bar, b, in combination substantially as shown and described.

Fourth, The cam wheel, L, in combination with the triangle, E, and the gear wheels, H and k, substantially as herein shown and described.

64,853.—PORTABLE ROOFING BOILER AND FURNACE.—Perry Fenlason, Cincinnati, Ohio.

I claim the boiler, B, in combination with the spring dray, A, or its equivalent, constructed substantially as above described and for the purpose set forth.

64,854.—ATTACHMENT TO STOVES FOR GENERATING GAS.—B. L. Fetherolf, (assignor to himself and J. N. Headesty), Tamaqua, Penn.

I claim the hollow metallic block, A, fitted within the fire chamber of stove so as to constitute both a gas generator and a lining or fire back, substantially as described.

64,855.—PUTTING UP OILS IN CASKS, &c.—P. G. Finn, Erie, Penn.

I claim the barreling and hermetically sealing of coal oil in a heated and expanded state, substantially as and for the purpose set forth.

64,856.—EDIBLE COMPOSITION.—Daniel Fobes, (assignor to Fobes, Hayward, & Co.), Boston, Mass.

I claim the edible composition as made of the materials in the manner and for the purpose substantially as described.

64,857.—EXTENSION TABLE.—George F. Folsom, (assignor to himself and Charles F. Pease), Roxbury, Mass.

I claim the combination as well as the arrangement of an auxiliary leaf, E, and mechanism (viz. its rods, k, elevators, H, and their counter cams, or the equivalents thereof,) for operating it as described with two leg frames, and their main leaves, D D, one of such leg frames being constructed with a space or recess arranged below the main leaf, and for the reception of the auxiliary leaf when the table is closed as described.

I also claim the combination as well as the arrangement of two auxiliary leaves, E E, and mechanism for operating them as described, with the three frames, A B C, and their main leaves, D D, arranged together as specified.

I also claim the combination as well as the arrangement of two turning leaves, F F, two main leaves, D D, three of the frames, A B C, as described, two auxiliary leaves, E E, and mechanism, viz.: its rods, k, elevators, H, and their counter cams or the equivalent thereof), for operating such leaf or leaves, E, as described.

I also claim the peculiar mechanism in combination applied to each turning leaf, and for operating each of the auxiliary leaves, such being the slide rods, k k, and the elevators and their counter cams, or their equivalents as set forth.

I also claim the combination as well as the arrangement of one turning leaf, F, two main leaves, D D, two leg frames, one auxiliary leaf, E, and mechanism, (viz.: its rods, k, elevators, H, and their counter cams, or the equivalents thereof, for operating such leaf as described.

64,858.—MECHANICAL MOVEMENT.—William Galladay, Sheboygan Falls, Wis.

I claim the combination of the arms, C D, and pawls, E F, with the ratchet wheel, A, as and for the purpose set forth.

Connecting the arms, C and D, at their inner ends, so as to be operated by one connecting rod, substantially as shown and described.

64,859.—GIG MILLS.—Ernst Gessner, Aue, Saxony.

First, I claim the construction and arrangement of the revolving disks, D, in the adjustable frame, C, substantially as described for the purpose specified.

Second, The arms, O O', with toothed segments, in combination with the rollers, N', and disks, D, constructed and operating substantially as and for the purpose set forth.

64,860.—GATES.—Robert D. Green, Columbia, Mo.

I claim the solid bed-sill or track laid in the ground, and detached from the gate post, and on which the gate rests, plain on upper surface with groove or rail as denoted by letters, H, also pin fastener top of posts, as shown by letter, G; also the track cleaners, marked, D D, fastened to underpart of bottom rail of the gate in front of each wheel, and designed, as the gate moves, to remove from track all obstructions to the wheels, C C; also guide posts, E E, used to prevent the gate from running off the track when open.

I also claim in combination with the posts of the main gate, represented by letters, H D D C C E E, letters patent for extended top and bottom rails or slats, to be used at pleasure in forming a gap moving the gate forward on the wheels, C C, so that the gap thus formed will admit the passage of small stock, and at the same time exclude large stock.

64,861.—MANURE DRAG.—Christian H. and Joseph H. Harnly, Pennsylvania Township, Pa.

We claim the arrangement of the fork drag, A A' A" A"', with its spring and lever, F E, clemp rod, D, and armed fork head, C B, runners, G, all combined and operating substantially in the manner specified.

In combination with the, fork-drag, figure, 1, and its ring, O, and hook, K;

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we also claim the rake-drag, figure 2, when used in connection with said fork drag in the manner and for the purpose set forth.

64,862.—METHOD OF PROPELLING CARS, ETC.—Charles T. Harvey, Tarrytown, N. Y.

I claim, First, the combination of the sliding pulley, Q, with the series of teeth on the axle, by which the said pulley is made fast to the axle, and with the springs, I I', of the guide rod, D, for the purpose of stopping the motion of a car, substantially as shown.

Second, I also claim the combination of the parts, a and b, composing both a fast and loose pulley, with the springs, I I', and the axle, A, for the purpose of starting the car substantially as shown.

Third, I also claim the use in cars or other objects which are moved by propelling cables of clutches or arms whose faces that receive the impulse of sach cables are plain, substantially as shown.

Fourth, I also claim so arranging the guide rod, D, and cable clutch or arm, C, that they are compelled to rotate together while the latter is allowed to have a longitudinal movement on the former substantially as set forth.

Fifth, I also claim the combination of anti-friction rollers, z, with the cable clutch or arm, C, to obviate or prevent friction during the movements of said clutch, substantially as set forth.

Sixth, I also claim the supplementary springs, I', for strengthening and aiding the main spring, I, and so arranging and connecting them between the sides of spring, I, and the frame of the car that they are not displaced or injured by any vertical motions of the car body, substantially as set forth.

Seventh, I also claim the application to a car of bent arms, X, to hold the car down, or prevent it from being displaced from the track, substantially as shown.

Eighth, I also claim the combination of the pendulous roller, q, with the disc, p, and loose pulley, b, substantially as described.

Ninth, I also claim the combination of the bar, M, and cam, O, with the lever, J, that operates the cable clutch or arm, C, substantially as described.

64,863.—HORSE HAY FORKS.—H. H. Hatheway, Clockville, N. Y.

I claim, First, The manner of securing the tines, C, to the handle by combining with each other the caps, b and b', bolts and nuts, a a, ring, c, and handle, A, substantially as shown and operating in the manner described.

Second, The adjustable bail, D, in combination with the rings, d, keys, d2, and brace, E, substantially as and for the purpose herein shown and described.

64,864.—BEEHIVE.—B. S. and E. H. Havland, Fort Dodge, Iowa.

We claim the arrangement in the bee box of the perforated partitions, b, and adjustable partitions, D, whereby the communication between the several compartments, C, may be opened or closed, substantially as described for the purpose specified.

64,865.—ATTACHING THILLS TO VEHICLES.—Thompson Hersee, Jr., Buffalo, N. Y.

I claim a thill coupling composed of a clip, A, so constructed as to have a chamber in its part to receive a piece of india-rubber or other elastic substance, C, and also to receive the cross head, e, of the thill iron, D, the front plate, c, of the chamber being notched or forked at its upper end and the top plate, a, of the clip over the chamber having an aperture made in it to allow the cross head of the thill iron to pass into the chamber with a projection, f, to serve as a guard to prevent the casual rising of the cross head, e, substantially as shown and described.

64,866.—CARRIAGE SPRING.—B. T. Henry, New Haven, Conn.

I claim an elliptic spring having one or more ribs, d, formed upon its surface, substantially as and for the purpose set forth.

64,867.—FASTENING FOR SHIRT COLLARS.—Frederick, Hess, Baltimore, Md.

I claim the fastener, composed of a plate with an eye on each side of it, one for holding an elastic loop to fasten the collar to the shirt, the other to hold a ring to secure the fastening to the collar as described.

64,868.—CULTIVATOR.—Jacob Hollinger, Millersburg, Ohio.

I claim the curved beam, A, as arranged in combination with the adjustable standards, B, and braces, E H, for the purpose and in the manner, substantially as set forth.

64,869.—ANIMAL TRAP.—J. W. Hollingsworth, Salem, Ind.

First, I claim the shaft, E, bearing the spring, G, eccentric, D, and double crank, H, to which are connected the rods, I, pivoted to wings, J, in combination with the rocking plate, L, supporting the pivoted levers, M, provided with stops, m3, constructed and operating in the manner and for the purpose specified.

Second, The stops, m3, in combination with the levers, M, pivoted to the rocking plate, L, arranged relatively with the shouldered eccentric, D, operating substantially as described for the purpose specified.

Third, The rod, P, provided at one end with a catch fitting into notch in the end board, F, and connected at the other end by rod, O', to lift gate, O, operated by the shouldered eccentric, D, and arranged relatively with the working parts of the trap herein described, substantially as and for the purpose specified.

64,870.—HOOP SKIRT.—William E. Houston (assignor to himself Geo. W. Hubbell and J. R. Lattin), Birmingham, Conn.

First, I claim securing the hoops to the tape by a clasp or other device inclosing the tape upon the hoop without extending through the tape, substantially as herein set forth.

Second, The combination of the cord band or other material inserted in or attached to the tape with the hoops when the hoops are attached thereto, substantially as specified.

64,871.—CLASP FOR HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim securing the two ends of hoops by a clasp corrugated thereon diagonally and at reverse angles upon opposite sides, substantially as described.

64,872.—TAPE OF HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim a tape formed with a longitudinal pocket, C, combined with transverse pockets, B, substantially in manner herein set forth as an improved article of manufacture.

64,873.—TAPE OF HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim the tape formed with the thread spaces, C, in combination with the pockets, B B, substantially as and for the purpose specified as an improved article of manufacture.

64,874.—METHOD OF MAKING BALANCE WHEELS FOR WATCHES, ETC.—Edward Howard, Boston, Mass.

I claim the process or mode of making a series of balance wheel disks or buttons by the use of the crucible the brass tube and the steel rod, substantially as herein described and for the purpose specified.

64,875.—SUGAR CANE STRIPPER.—S. Terry Hudson, Success, N. Y.

I claim, First, The double pairs of springs, B B, having lap jaws, c c, for opening by each other, and varying the spaces, C C, and combination with the swivel guard plate, d, attached to the spring, D, and the stand, A, all arranged and operating substantially as and for the purpose herein described.

Second, The shifting spring, E, in combination with the springs, B B, arranged and operating as and for the purpose herein set forth.

Third, The movable stand, A, provided with the point, h, or its equivalent and the head, F, in combination with the spud, a, arranged as and for the purpose herein specified.

64,876.—WASHING MACHINE.—George R. Hughes, Centralia, Mo.

I claim the cylinder or drum, E, the bent lever, C, the lever, J, the ratchet and pawl, C, f, or tightening the cord on the cylinder or drum, F, the shaft, E, the cords, H and K, and the disk, D, constructed, arranged and operating substantially as described in combination with the frame A.

64,877.—SEED PLANTER.—D. H. Hull, Plantsville, Ct.

I claim, First, The device for operating the slides, j j, of a seed planter consisting of the lugs, m, on the slides, connecting rods, O, crank shaft, C, pinion, b, and internal gear on driving wheel, F, all combined with each other and made and operating substantially as herein shown and described.

Second, The device for raising and lowering the hinged frame, H, which consists of the chains, K, passing over the pulley, c, on the stationary arm, N, shaft, L, and ratchet wheel and pawl, h i, all made and operating substantially as herein shown and described.

Third, The frame, H, when it is provided with the seeding boxes and when it is hinged to the main axle, A, substantially in the manner and for the purpose herein shown and described.

64,878.—CULTIVATOR.—James M. Hume (assignor to himself and C. F. Hoyt), Colchester, Ill.

I claim the adjustable beams, B, arranged in combination with the frame, A, levers, K, links, L, bar, C, and single tree, M, as and for the purpose, substantially as described.

64,879.—ENVELOPE.—Ralph S. Jennings (assignor to himself and N. G. Kellogg), New York City.

I claim, First, In constructing flat envelopes cutting and folding the same to form corner wings, E E, at the ends thereof in combination with the eyelet seals, e e' substantially in the manner and for the purpose herein described.

Second, Fastening central flaps, C C, of an envelope with the double metal spars, d d, or their equivalents as and for the purpose herein specified.

64,880.—PERMUTATION LOCK.—A. W. Johnson and George Thompson, New York City.

We claim the adjustable tubes, O, of unequal length fitting over each other their outer ends provided with teeth, c, which fit into corresponding teeth in the flange, d, of the graduated adjustable rings, Q, fitting one within the other, the said tubes provided upon their inner ends with notched disks, M, the notches in the outer ring being beveled upon one side, when all are constructed, and arranged as described and operating from the yoked shaped bolt, S, provided with the spring pawl, W, substantially as described for the purpose specified.

64,881.—MOTIVE POWER.—W. B. Jones, Franklin, Ky.

I claim the combination of the inclined wheel or frame, A, cylinder, C, and lever shaft, E, when arranged together so as to operate together, substantially in the manner and for the purpose described.

64,882.—PRUNING SHEARS.—Peter Keck, Zanesville, Ohio.

First, I claim the mode of attachment of the blades of a pair of shears composed of three levers, substantially as shown and described.

Second, The combination of a convex edged cutting blade with the mode of attachment of the blades of a pair of shears, composed of three levers, substantially as shown and described.

64,883.—HORSE SHOE MACHINE.—John W. Kingsbury, New Bedford, Mass.

First, I claim the slotted arm, E, in combination with the sliding frame, F, and die, G, whereby the movement of said die is initiated substantially as herein shown and described.

Second, The adjustable rollers, H, having upper and lower plates of different diameters and thicknesses in combination with the slotted plates, g, all as herein shown and described.

Third, The combination of the adjustable block, M, or its equivalent with the reciprocating die, G, for the purpose of flattening the toe of the shoe, substantially as set forth.

Fourth, The combination of the reciprocating die, G, adjustable rollers, H, clamping jaws, I, for the purpose of forming horse shoes, all made and operating as herein shown and described.

Fifth, The adjustable block, M, or its equivalent in combination with the reciprocating die, G, and clamping jaws, I, for the purpose of flattening the toe of the shoe, all as set forth.

Sixth, The device for operating the jaws, I, consisting of the cam, o, on shaft, C, rod, n, block, L, rollers, m m, plates, l l, and springs, q q, all made and operating substantially as set forth.

64,884.—HEATING STOVE.—A. Lee, St. Paul, Minn.

I claim the deflector, E, and the vertical cylinder, D, in combination with the air cylinders, B and C, as and for the purposes specified.

64,885.—HOG HOLDER.—W. and C. Leffingwell, Clarksburg, Ohio.

We claim, First, The device for holding hogs for the purposes of wireing, ringing, or snouting, or for slaughtering or otherwise operating upon them, adjustable to the size of the hog, in manner and by the appliances, substantially as described.

Second, The hinged side, D', when combined with the hinged roofing, E E F F, or their respective equivalents, substantially as described.

Third, The inclined slat, H, or its equivalent, when combined with a box or trough, having its front opening contracted by the slats, G G', or by an equivalent construction, substantially as described.

Fourth, The tail-gate, I, or its equivalent, when combined with a box or trough having its front opening contracted by the slats, G G', or by an equivalent construction, substantially as described.

64,886.—DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.

I claim the rotatory screw elevator, in combination with the bearing, arranged to operate in the manner substantially as and for the purpose set forth.

64,887.—MODE OF DESULPHURIZING IRON ORE.—John Little, Newburgh, N. Y.

First, I claim the mode of desulphurizing iron ore by heating it in a furnace to red-hot temperature and throwing it then in cold water, substantially as set forth.

Second, The combination of processes for desulphurizing iron ore and preparing it for direct use in cupolas by heating, cooling in cold water, crushing between rollers, washing and mixing with fluxes for the reduction, to clean iron in cupolas.

Third, The furnace, A, in combination with the movable plates, S1 S2, and the hoisting gears, M1 M2, for moving these plates with the the ore, substantially as set forth and as shown in the drawing.

64,888.—HARVESTER RAKE.—John M. Long, Hamilton, Ohio.

First, I claim the rake head, I, attached to a shaft, H, on a disk, G, having an inclined axis, and arranged with a spring, J, to operate in the manner substantially as and for the purpose specified.

Second, The sleeve, F, placed loosely on the shaft, C, in connection with the clutch, L, when said parts are used in connection with the rake and beaters, in the manner substantially as and for the purpose set forth.

64,889.—Cancelled.

64,890.—CAR COUPLING.—W. H. Mayo, Hillsburgh, Nova Scotia.

I claim the draw hook, B, connected by a pin, a, to one draw-head, A, in combination with the box, D, attached to the other draw-head, C, and provided at its front part with an inclined bottom, c, the bent plate, E, lever, F, connected with plate, e, and with an arm, i, by a rod, k, and the spring, g, all arranged to operate substantially in the manner as and for the purpose herein set forth.

64,891.—CAN OPENER.—T. A. McFarland, Meadville, Pa.

I claim, as a new article of manufacture, the can opener consisting of the handle, A, and cutters, C, constructed, arranged, and operating as described, for the purpose of cutting out a disk or plug at a single blow, as set forth.

64,892.—SOLAR CHRONOMETER.—Lloyd Mifflin, Germantown, Pa.

I claim a gnomon so formed as to throw the shadow backward when the sun is fast, and forward when it is slow, to an extent equal in each case, to its variation from mean or clock time, so that the shadow of the gnomon will always cross the time scale at a point indicating the mean time, substantially as described.

I also claim correcting the variation from mean or clock time by the use of the sun's motion in his declination, north and south.

64,893.—GRINDSTONE.—Warren P. Miller, New York City.

First, I claim the mode of securing the blocks, B, to the disk, A, by means of the flange, a, and keys, C, all made and operating substantially as herein shown and described.

Second, The grooves, d d', when arranged in the grinding surface, substantially in the manner and for the purpose herein shown and described.

Third, Constructing grindstones by combining the shaft, D, and the disk, A, with the stones, B, keys, C, all made and operating substantially as and for the purpose herein shown and described.

64,894.—DOOR INDICATOR.—Francis E. Mills, San Francisco, Cal.

First, I claim the reversible box, b, provided with the lettered cover, c, having the hole, h, and the revolving disk, F, said box containing a series of letters or blank disks, S S, adapted to be placed in the sink, t, in the reverse end of said box, substantially as described for the purpose specified.

Second, The reversible box, b, in combination with the door glass plate, A, having circular opening, B, and semicircular opening, D, substantially as described for the purpose specified.

64,895.—STEAM GENERATOR.—Thomas and Thomas H. Mitchell, Albany, N. Y.

We claim the generator mounted so as to rotate on a horizontal or nearly horizontal axis, and within a furnace, substantially as described, in combination with the pipe or pipes for supplying and jetting the water, substantially as and for the purpose set forth.

We also claim the combination of the generator rotating within the furnace, the steam pipe and steam chest, and the pipe for supplying and jetting the water within the generator, substantially as and for the purpose set forth.

We also claim the combination of the generator rotating within the furnace, the pipe for supplying and jetting the water, the steam pipe and steam chest, and the blow-off pipe substantially as and for the purpose set forth.

We also claim the steam pipe attached to and rotating with the generator, and provided with apertures, when combined with the steam chest and stuffing box, so that while rotating, it will discharge the steam into the stationary chest, substantially as and for the purpose set forth.

64,896.—BOLT AND RIVET MACHINE.—John Morgan, Jr., Wheeling, W. Va.

First, I claim the construction and arrangement of the solid die, x', follower, U, header, N, and cams, D E F and I, upon the shaft, B, substantially as herein shown and described for the purpose specified.

Second, The carrier, W, knife, 10, and shield, 16, combined, arranged, and operating in the manner and for the purpose specified.

Third, The solid die, x', for forming the under side of the head of the rivet concave, as herein set forth for the purpose specified.

64,897.—BOX FOR BLUEING AND OTHER POWDERS.—George A. Moss, New York City.

I claim a box for powders, of the class specified, constructed of wood and provided with a cover of foil, or its equivalent, substantially as shown and described.

64,898.—CAR COUPLING.—John H. J. O'Neill, New Haven, Conn.

First, I claim the combination of the hook, F, the pawl, I, and lever, N, when constructed and arranged so as to operate substantially in the manner herein set forth.

Second, The head, C, constructed so as to be depressed, independent of the case, B, substantially as set forth.

Third, The arrangement of the lugs, f, or in combination with the frame, R, operating so as to relieve the spring, substantially as herein set forth.

64,899.—PORTABLE BLACKING CASE.—Abraham W. Overbough, New York City. Antedated May 16, 1867.

First, I claim the arrangement and combination of blacking and polishing utensils, in the manner described, so that the case, when unfolded, forms a stand or bench.

Second, I also claim the feet, combined with the devices, in the manner so as to form an even surface when closed.

64,900.—KNITTING MACHINE.—Arthur Paget, Loughborough, Great Britain.

I claim, First, The method of and arrangement for retaining each sinker in position by a spring which also assists the action of the sinker when sinking the thread.

Second, The combination of the bars, C3 D, and the sinkers, C, when the whole are constructed and operate in connection with each other as set forth.

Third, The arrangement for drawing across the incline or other equivalent, first in one direction and then in the other, by a double grooved pulley revolving with the main shaft, and by cords or chains and weights or catch blocks, so arranged as to draw across once during a part of each revolution.

Fourth, The method of suspending the action of the drawing across motion by the employment of an incline or cam piece, so arranged that when required it can be made to lift a hinged incline piece, or other mechanical equivalent, and thus prevent the catch block entering the notch in the drawing across pulley, by which the said catch block would otherwise be carried round.

Fifth, The method of producing a selvedge in any part of the width of the frame by the employment of an incline or other mechanical equivalent attached to and traversing with the incline for actuating the sinkers or their equivalents, by which first mentioned incline the thread layer or thread layers is or are made to descend and pass between the needles at the end of each course.

Sixth, The plates, E', of steel or other hard metal, in combination with the bar, E, as described.

Seventh, The method of alternately knitting web and narrowing or widening the same, or making changes in the knitting by moving endwise in the direction of their axes the set of cams or levers employed in knitting the web, and another set or sets of cams or levers employed in effecting the narrowing, widening, or changes in the knitting.

Eighth, The method of producing by a self-acting motion, in which cams, inclines, or levers can be used, the before-mentioned endwise movements of the cams or levers, which said self-acting motion can be (without arresting the revolution of the cams) brought into operation by hand, or by tappets, or holes in an endless chain, belt, drum, or pulley.

Ninth, Each of the foregoing methods or arrangements in combination with any or all of the other methods or arrangements.

64,901.—BEDSTEAD.—Isaac Pedrick, Bridgeton, N. J.

First, I claim the frame, E F G H K, and hooks, I, or their equivalent, in combination with each other and with the posts, D, substantially in the manner herein shown and described and for the purpose set forth.

Second, The post sockets, C, in combination with the posts, D, rails, A and B, and frame, E F G H K, substantially as herein shown and described and for the purpose set forth.

Third, Stringing the slats, L, upon or connecting them with a cord or tape, M, substantially in the manner herein shown and described and for the purpose set forth.

64,902.—CARD HOLDER.—Henry H. Pember, New York City.

I claim the card holder consisting of rectangular piece of metal, B, having a flange, a, along the edges of the two ends and its lower side, D, the upper side left open and provided near its center with the catch, E, and perforated ear pieces, F F, when all are constructed of one piece of metal, as herein set forth.

64,903.—MACHINE FOR SWAGING HORSESHOE BLANKS.—Chas. H. Perkins and Richard W. Comstock, Providence, R. I.

We claim the combination of the vibrating swaging bar, C, operating as described, with the stationary bar, A, for swaging the heels of horseshoe blanks, substantially as described.

64,904.—BOLT HOLDER.—Bacchus Perry and Aaron Cornish, Lee, N. Y.

We claim the bolt holder constructed and operating substantially in the manner and for the purpose herein described.

64,905.—CULLENDER BOILER.—Benj. F. Porter, Manchester, N. H.

First, I claim the perforated boiler, A, with double L-shaped slots, a, resting wires, b, and movable bottom constructed as described, and operating in the manner as and for the purpose specified.

I also claim the divider, E, in combination with a culinary boiler of any kind, when constructed and used substantially as described for the purposes specified.

64,906.—GANG PLOW.—L. O. Rockwood, Ottawa, Ill.

I claim the adjustable extension joint, fig. 4, constructed substantially as and for the purpose described in the foregoing specification.

64,907.—TRUNK.—Columbus A. Rose, Columbus, Ga.

I claim a trunk provided with a triangular hinged portion, B, and internal doors or lids, E, capable of being employed as shelves, substantially as described.

64,908.—SKATE FASTENING.—Duane A. Ross, New York City.

First, I claim the combination of the screw rods, a b, with the sole and heel clamps and with the thumb nuts, e k, for the purpose of fastening or detaching the skate to or from the boot or shoe, substantially as described.

Second, I also claim incasing the screw rods, nuts, and curved arms substantially as herein described, to prevent them from injury by snow, ice, water or other causes, substantially as described.

Third, I also claim hinging the clamp plates, n, to the clamp arms, d, for the purpose of adapting the clamping surface to the varied shapes or tapers of the heels of boots or shoes, substantially as described.

64,909.—COTTON AND HAY PRESS.—J. G. Roux, Raymond, Miss.

I claim the independent screws, B, having the same pitch but reverse motion, having pinions, E, on their inner ends, operated by the same pinion, D, operating in combination with the nuts, G, and braces, F, substantially as described for the purpose specified.

64,910.—HANGING AND LOCKING SASH—Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolff and John Schachtschober), Chicago, Ill.

I claim the half-round locking stud, I, in combination with a rack, J, and pinion, F, to lock a window sash at any desired point, substantially as set forth.

64,911.—SASH SUPPORTER.—Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolff and John Schachtschober), Chicago, Ill.

I claim the combination of the screw cylinder, A, shank, C, spring, I, and fork, e, with the roller, d, substantially as and for the purpose set forth.

64,912.—SEED SOWER.—Elijah U. Scoville, Manluis, N. J.

First, I claim having two or more hoppers, E, within one seed box, D, substantially as and for the purpose herein shown and described.

Second, The grooved roller, F, when arranged below the hoppers and when provided with adjustable slides, e e, by which the amount of the seed discharged is regulated, substantially as set forth.

Third, The revolving spreader, G, when provided with perforated wing, i i, substantially as and for the purpose herein shown and described.

Fourth, The perforated wings, i i, when arranged in zig-zag lines upon a revolving shaft, G, substantially as and for the purpose herein shown and described.

Fifth, The hoppers, E, when arranged in a seed box, D, which is supported by braces, b, in combination with the spring, c, and screw, a, and roller, F, substantially as herein shown and described.

Sixth, The grooved roller, F, in combination with the rubber scrapers, h, which are secured in that side of the hoppers, E, towards which the seed is carried by the roller, as set forth.

Seventh, The zig-zag perforated revolving spreaders, in combination with the grooved roller, F, and hoppers, E, all made and operating substantially as herein shown and described.

64,913.—TIP-CART BODY FASTENING.—John E. Seavey, Kennebunkport, Me., assignor to himself and S. E. Bryant.

I claim the cart body fastener made substantially in the manner and for the purpose and to operate as specified, it being composed of the weighted arm, A, the eccentric, b, the yoke, B, and the bearing, C, formed and arranged as explained.

64,914.—PLOW POINT.—David J. Selden, Mount Vernon, Ohio.

I claim the wrought-iron tenon cast in the cast-iron share with shoulders on each of the four sides of the tenon, the point with the mortise to fit the wrought-iron tenon with either side of the point up and with the back end of the point of the same size and meeting the shoulders on the cast-iron share. The countersunk hole through the mortised point and the wrought-iron tenon with the pin passed through the hole to keep the point to its place on the tenon and the split point of the pin so sprung as to keep it in its place and to hold the point to its place on the tenon with either side up.

64,915.—HOISTING GEAR.—H. F. Shaw, West Roxbury, Mass.

First, I claim the combination as well as the arrangement of the ring gear, H, and spur gear, D, operating as described and for the purpose set forth.

Second, The combination of the ring gear, H, with the lever, K, made substantially as described and for the purpose set forth.

64,916.—MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon, Va.

I claim the improved method of manufacturing iron and steel, substantially as herein described.

64,917.—GARDEN CULTIVATOR.—George W. Smith, Mount Olivet, Ky.

I claim the cultivator in its combined form having a number of tools, E F F G G H, easily detached for separate use and capable of combined use, substantially as described.

64,918.—CAR COUPLING.—J. Smith and J. F. Irwin, La Porte, Ind.

We claim the slide, D, the pinion, E, the coupling pin, B, and the shaft, F, constructed, arranged and operating substantially as herein shown and described, in combination with the draw head of a railroad car, for the purposes set forth.

64,919.—CORN SHELLER.—E. E. Stedman, Randolph, Ohio.

I claim the jaws, C, springs, E, as arranged in combination with the case, A, for the purpose and in the manner described.

64,920.—TEMPORARY RUDDER.—H. L. Stibbs, Savannah, Ga.

I claim the combination of the chains, D, or their equivalent, and branched or forked hinge-straps, C, with the body of the rudder, B, substantially as herein shown and described and for the purpose set forth.

64,921.—CAR COUPLING.—W. A. Stowell, Moretown, Vt.

I claim the combination of the yoke, E, holding the coupling pin, F, bumper head, A, having two mouths, bent lever, I, and pivoted hook, H, substantially as described for the purpose specified.

64,922.—ADJUSTABLE ECCENTRIC.—James B. Strickland, Scranton, Pa.

I claim the combination and arrangement of the collar and arm, B C, and the eccentrics, E F, substantially as herein shown and described for the purpose set forth.

64,923.—GANG PLOW.—J. W. Sursa, San Leandro, Cal.

First, I claim the combination and arrangement of the shaft, c, the segment arms, d d', the axles, g g', of the wheels, D D, the hand lever, h, and the rack, k, for raising and lowering the gang plows, A A, substantially as herein described.

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Second, The arrangement of the draft pole, F, pivoted to the plow beams, B B, and depressed and elevated by the screw, a, substantially as and for the purpose set forth.

64,924.—GATE.—Jacob Vail (assignor to himself and John H. Linderman), Beloit, Wis.

First, I claim the arrangement of the cords, H and I, and pulleys, J L O P, with each other and with the gate, B, for the purpose of opening and closing said gate, substantially as herein shown and described.

Second, Making one of the horizontal boards or bars of the gate act as a sliding latch, substantially as herein shown and described and for the purpose set forth.

Third, The combination of the coiled spring, E, or its equivalent, with the sliding bar, b', substantially as herein shown and described.

Fourth, The combination of the pivoted lever, T, with the gate, B, sliding bar, b', and operating cords, H and I, substantially as herein shown and described and for the purpose set forth.

64,925.—ATTACHING BURNERS TO LAMPS.—H. Weston, Towanda, Po.

I claim providing the interior of the collar, C, with a screw and having the exterior of the projection, B, covered with a packing, a, of leather or any suitable cement or composition, with set screws, c, passing through the collar, substantially as and for the purpose set forth.

64,926.—PLANTER AND MANURE DISTRIBUTOR.—Benjamin F. Whitner, Madison, Fa.

I claim the combination of the furrow opener, q, the furrow wheel, A, and the covering drag, D, with each other and with the planting cylinder, C, and the seed receptacle, B, substantially in the manner and for the respective purposes herein set forth.

I also claim the grooved planting cylinder, C, when it is combined with a jointed and a recessed ring, i, and when the said cylinder works in combination with the furrow opener, q, the furrow wheel, A, and the covering drag, D, substantially in the manner herein set forth.

64,927.—SHOVEL PLOW.—Albert Wilcox, Maquoketa, Iowa.

I claim the attachment of the third shovel, A, by means of the curved supporting bar, B, to the beam, C, of the main plow, also the manner of equalizing the draft of said plow by making the left-hand standard of the main plow more curved and the shovel on the same a size larger, in the manner and for the purpose above set forth.

64,928.—EGG BEATER.—Marvin T. Williams, Milwaukee, Wis.

I claim, propeller blade, M, beating arms, L, shaft, I, pinion, F, cover, H and cog wheel, D, arranged and combined substantially as and for the purpose described.

64,929.—STEAM GENERATOR.—Joseph Woodruff, Rahway, N. J.

First, I claim the connection of two boilers by means of the pipes, D D, substantially as described.

Second, I also claim extending the tubes, D D, a nozzle into the boiler and bending or deflecting the same, for the purposes substantially as set forth and described.

64,930.—CAR SPRING.—Henry A. Alden, Matteawan, N. Y.

I claim, in a spring composed of one or more pairs of concavo-convex, or conical, and radially corrugated plates as described interposing between the plates of each pair a disk of vulcanized rubber, or other elastic body of suitable dimensions, substantially in the manner and for the purposes set forth.

64,931.—BRACE FOR BITS.—Charles H. Amidon, Greenfield, Mass.

I claim the combination of the clamping stirrup, B, and shoulder, G, in the shank of a bit brace, for the purpose set forth.

64,932.—CLOTHES WRINGER.—Charles H. Amidon, Greenfield, Mass., assignor to the Bailey Washing and Wringing Machine Company, Woonsocket, R. I.

First, I claim the cog wheels, C D E F, connected together at their axles by the straps or links, d e f, so as to form a flexible train of gearing between and in combination with the rollers B B of a clothes wringing machine, substantially as and for the purpose set forth.

Second, The levers, H H, arranged substantially as set forth to be in opposition to a resisting force exerted by a spring or springs, or their equivalent.

64,933.—COFFER DAM AND BOAT.—William H. Applegate, Le Claire, Iowa.

First, I claim the construction and arrangement of a floating coffer dam and boat combined having the water-tight compartments and provided with the series of frames arranged to support the planking, substantially as herein shown and described.

Second, In combination with a combined coffer dam and boat constructed as described, I claim the shafts, A and F, and the carrier or endless belt, D, for removing material from within the dam, substantially as set forth.

Third, I claim the construction and arrangement of the boat with an opening at its rear end, substantially as described.

64,934.—SEPARATING ZINC FROM GOLD AND SILVER.—Edward Balbach, Jr., Newark, N. J.

I claim a movable black-lead retort formed with a neck and introduced within a furnace, substantially as set forth, for receiving gold, silver, lead, and zinc alloys and distilling off the zinc, the remaining alloy being poured out by inclining the retort, as set forth.

64,935.—MACHINE FOR WIRING BLIND SLATS.—Peter Barry, Newark, N. J.

I claim, First, The independent cut-off, F, arranged to operate upon the staples by coming between them from above, substantially as described.

Second, I also claim the independent cut-off in combination with the guides, e e, which guide its free end to the guide strip, B, substantially as shown.

Third, I also claim the combination of the elbow lever, S, the slot, F, the pawl, L, and the adjusting shoe, M, substantially as shown.

Fourth, I also claim in combination with the feeding pawl, L, the adjusting shoe, M, and the feeding bar or rack, substantially as shown.

Fifth, I also claim the application of a spring plate, R, to the feeding mouth or space below the plunger, when arranged and combined with a rigid or unyielding guide strip, B, substantially as set forth.

64,936.—ATTACHING CARRIAGE THILLS.—A. R. Bartram, Redding, Conn.

I claim, First, The adjustable coupling, A, in combination with the cross bar, C, substantially as set forth.

Second, The tang, B, of the coupling, A, provided with a groove, as set forth, in combination with the socketed cross bar, C, and the set screw, E.

64,937.—LIFTING JACK.—J. H. Bean, Marietta, Ohio.

I claim the lever, E, and serrate bars, C C', both the latter working in the vertical passages, B B', for greater security, in combination with the levers, F F', and detents, G G', and springs, b b', the detents pivoted to the levers and operating at right angles to the said bars, substantially as described.

64,938.—LATHE.—William B. Bement, Philadelphia, Pa.

I claim, First, The combination of the spindle, C, its two overhanging ends, driving wheel or pulley, F, and bearings, B B, the whole being arranged substantially as and for the purpose herein set forth.

Second, The combination of the said spindle and its two overhanging ends with the bed, b, carrying two slide rests when the said spindle can be adjusted from and towards and in a direction at right angles to the said bed, b.

Third, The said spindle, C, its adjustable bearings, B B, and its cog wheel, F, in combination with the adjustable arms, I I, and the gearing herein described, or its equivalent.

Fourth, The combination of the two slide rests, the two screw shafts, m and m', for operating the said rests, the driving pinion, n, and the two clutches, p and p'.

64,939.—LIFE PRESERVER.—John M. Billhofer, Irvington, N. Y.

I claim the double cone-shaped frame, A, provided with the bag, B, and jaws, C, substantially as and for the purpose shown and described.

64,940.—OSCILLATING ENGINE.—William E. Bird, New York City.

I claim the combination in steam or other oscillating engines, with the trunion of the engine cylinder of a reciprocating slide valve working against a fixed or stationary seat and operating to control the ports or passages of the engine, substantially as described.

64,941.—COMBINED BACK SIGHT AND CARTRIDGE RETRACTER FOR FIRE-ARMS.—G. W. Bowlby, Pontiac, Mich.

I claim the sight, F, constructed and used in combination with the barrel, A, for the purpose of forming a sight and retractor at the same time, substantially as specified.

64,942.—CARRIAGE TRIMMING.—Charles Bried, Newark, N. J.

I claim rubber or gutta-percha tubes, sleeves, or rings or compounds of gum elastics when made and used in the forms and for the purposes hereinabove designated.

64,943.—HEATING STOVE.—Albert Brown, Troy, N. Y.

I claim, in connection with the combustion chamber of base burning stoves, the arrangement of a fuel reservoir or supply chamber, C, directly under an oven, B, substantially in manner as herein described and for the purpose set forth.

64,944.—WARP EYES OF WIRE HEDDLES FOR LOOM HARNESS.—Darius C. Brown, Lowell, Mass.

I claim my improved heddle eye made substantially as described, that is, of wires or parts of a wire twisted together and subsequently spread laterally at the angle or angles of junction, in manner substantially as set forth so as to tighten the twist at either or both ends of the eye, as and for the purpose as hereinbefore explained.

64,945.—GATE.—John A. Burchard, Beloit, Wis.

I claim an improved farm and carriage gate when constructed and operated substantially as set forth and for the purpose specified, in combination with the vault, O O, weight, C, lever, D, pulleys, E E, tracks, Q Q, cords, e f, latch, b, pulleys, H H, posts, A A G G, and platform, P.

64,946.—LIFTING JACK.—Charles Butterworth, Miamisburg, Ohio, assignor to himself and Jacob Kercher.

I claim the combination and arrangement of the uprights, A and B, the lever, E, with its fulcrum roller, n, and the supporting pieces, F, constructed substantially as described and for the purpose specified.

64,947.—APPARATUS FOR ACCUMULATING AND RECLAIMING HEAT.—Thos. J. Chubb, Brooklyn, N. Y.

I claim, First, The employment in a chamber or chambers of a series of tubes arranged in such manner that the exterior surfaces of said tubes are exposed to or are in communication with the waste heat passages in the chamber in which said tubes are arranged and the space or passages between the tubes in said chamber are in communication with the chamber of combustion, and also to and with the passages leading to the chimney and the interior of said tubes or passages therethrough, are in communication with a separate chamber or passage leading from the gas generating furnace to and through the interior of the said tubes to the chamber of combustion, when the foregoing is combined with substantially a similar chamber, series of tubes, spaces, passages, and communications, the interior of such latter series of tubes being in communication with the passage leading from the open air to and through the interior of said tubes to the chamber of combustion, substantially as described.

Second, The combination in or with a gas generating furnace of a chamber or chambers containing a series of tubes made hot by the waste heat produced by the combustion of gas and air heated in these passages as separate currents to the place of combustion in a direct or continuous manner by opposite surface action or passage of the heat through the material of which said tubes are composed, substantially as described.

Third, The employment of a series of tubes so arranged that they may be heated by the products of combustion produced by the mingling together of heated air and gas when said air and gas have been heated by heat communicated through the material of which the said tubes are composed, substantially as described.

Fourth, The employment of a chamber or chambers containing a series of tubes so arranged as to present an extensive caloric absorbing surface and conducting heat through the material of which said tubes are composed and communicating it to and heating a current or currents of air and gas or gases passing on or over the opposite side of the said tubes.

Fifth, Constructing chambers with a series of tubes for the entrance of continuous currents of air and gases for supporting combustion in a separate chamber, which currents are heated by waste heat or the products of combustion of such heated currents passing in opposite directions or nearly opposite directions and on opposite sides of said tubes and through the material of which they are composed, for the purposes specified.

Sixth, Making provision for heating air and reheating gas in their passage to a chamber of combustion by the heated products resulting from combustion in said chamber when said gas, air, and heated products flow through their respective passages without requiring reversal, substantially as specified.

64,948.—COMBINED GRAIN THRASHER AND CLEANER.—Adrian Cornell, Newtown, Pa.

I claim, First, The combination substantially as described of the thrashing cylinder, the double vibrating shaker, the fan, and the shaking shoe, when arranged for joint operation as set forth.

Second, The detachable shoe frame, R, constructed and arranged as described.

Third, The combination of the shaker, the shaking hopper and the riddle, arranged for joint operation as described.

Fourth, The combination of the driving shaft and pulleys with the cylinder shaft and pulleys and the pulleys on the fan shaft, arranged and operating as described, for the purpose of adapting the machine to use with either an undershot or overshot horse-power without crossing the belts.

64,949.—LIFTING JACK.—Charles Crow, Onargo, Ill.

First, I claim the arrangement and combination of the movable steps, I, racks, D, and guides, B C, when constructed to operate substantially as and for the purpose set forth.

Second, The combination of the roller, H, rope, E, pulley, J, inner guides, C, and drum, v', when arranged substantially as and for the purpose described.

64,950.—CHURN AND PUMP POWER.—Francis Danzenbaker, Bridgeton, N. J.

I claim the pendulums, B and K, and their attachments, lug, C, shaft, D, and arms, G and F, when arranged to operate both a churn and pump, either separately or combined, substantially as set forth.

64,951.—MACHINE FOR APPLYING ANIMAL POWER.—Jonathan Dearborn, Seabrook, N. H.

I claim the combination and arrangement of the inclined shaft, A, the wheel, C, the guard, E, and the platform, G.

I also claim the combination of the shaft, A, the wheel, C, the guard, E, the fender, D, and the platform, G.

I also claim the combination of the beveled gears, H I, the shaft, K, the shaft, A, the wheel, C, the guard, E, and the platform, G, the whole being arranged so as to operate as specified.

64,952.—HOOPS FOR SKIRTS.—L. De Forest, Birmingham, Ct.

I claim protecting the hoops of hoop skirts by a succession of metallic clasps or spangles, in the manner and for the purpose substantially as herein set forth.

64,953.—SAW.—Charles Disston, Philadelphia, Pa.

I claim an elastic detachable forked key, C, constructed and adapted to the retention of a detachable saw tooth, substantially as specified.

64,954.—PROCESS OF TREATING STEEL BLADES, ETC.—Henry Disston, Philadelphia, Pa.

I claim the within described mode or process of treating blades or other thin pieces of steel, that is to say: straightening and condensing them by impact or pressure immediately after they have been reduced to the desired temper, and while they are still hot, as described.

64,955.—CARRIAGE WHEEL HUBS.—L. Dorman, Worcester, Mass.

First, I claim the combination of the grooved wooden part, A, with the metal shell, B, substantially as and for the purposes set forth.

Second, The combination of the grooved wooden center or core, A, and the spokes, E, with the slotted or metal shell part, B, substantially as and for the purpose set forth.

64,956.—AUTOMATIC LUBRIBATOR.—Isadore Dreyfus, New York City.

I claim an automatic lubricator, constructed to be applied as described provided with a loose rod or dasher, set in motion by the journal for conducting the lubricating material thereto, substantially as specified.

64,957.—SASH PULLEY.—Simon Drum, Allegheny City, Pa.

I claim a shell for a sash pulley, said shell being made in halves and without a face piece, and so arranged that the openings for the screws are divided by the line of separation between the halves of said shell, whereby one half of each opening for the screws are cast in the ends of each half of the shell, the whole being constructed, arranged, and operating substantially as herein described and for the purpose set forth.

64,958.—SUPPORT OR BEARING FOR FRICTION ROLLERS.—Stephen W. Eaton, Farrington, Me.

I claim the box, A, constructed substantially as specified, viz.: with the elongated recesses or notches, a a, to receive the journals of the roller, B, and so made as to enable the roller to rest on the base plate, c, of the box, and roll thereon a short distance in either direction from the middle of the plate, as described.

64,959.—WOODEN PAVEMENT.—Henry Fayette, Port Chester, N. Y.

First, I claim the sections of pavement composed of a number of wooden blocks, bolted together longitudinally and transversely, substantially as described.

Second, In sections of pavement composed of wooden blocks, bolted together as described, I claim making the blocks in the outer tier of each section longer than the central blocks, as and for the purpose described,

64,960.—WOODEN PAVEMENT.—Henry Fayette, Port Chester, N. Y.

First, I claim locking together sections of wooden pavement by means of tongues and grooves, so arranged that each section will be supported by every adjoining section, substantially as described.

Second, I also claim sections of pavement, composed of wooden blocks bolted together as described, and provided with tongues and grooves so arranged that when laid down in a pavement each section will be locked with all the adjoining sections by means of said tongues and grooves, substantially as described.

64,961.—DEVICE FOR LUBRICATING WHEELS, ETC.—John C. Fish, Barnstable, Mass.

I claim a lubricating apparatus constructed of a reservoir, in which is located the tube, c, provided with openings as described, and with a perforated movable tube, i, operating substantially as described.

64,962.—MARINE FURNITURE.—Josiah Foster, Sandwich, Mass.

I claim a construction of movable furniture for vessels such that by means of packed joints, arranged and operating as set forth, it can be transformed into boats, substantially as described.

64,963.—MACHINERY FOR MAKING NAILS.—Thaddeus Fowler, Seymour, Conn., assignor to the Fowler Nail Company, New Haven, Conn.

First, I claim moving the rod of blanks forward and adjusting successively each blank to its proper position before the dies bite upon it, by means of the lateral flanges, o s, arranged and operating in the manner herein described.

Second, I claim combining with devices for feeding the nail blanks, the two pairs of cutters, h and m, and l and n, arranged substantially as described.

Third, I claim the combination of the cutters, h and m, l and n, with the rollers, d and e, formed with cam-shaped surfaces, i, and flanges, o and s, as and for the purposes specified.

64,964.—MACHINE FOR MAKING HORSE-SHOE NAILS.—Thaddeus Fowler, Seymour, Conn., assignor to the Fowler Nail Company, New Haven, Conn.

First, I claim the jaws, n n, fitted and actuated substantially as specified, to straighten the nail by pressure on its edges, as set forth.

Second, I claim the die, p, in combination with the carrier plate, h, for acting upon the side of the nails as brought around successively, as specified.

Third, I claim the cutter, q, in combination with the carrier plate, h, for clipping off the nail points as successively presented by said carrier plate, h, as set forth.

Fourth, I claim the spring friction plate, t, in combination with the carrier plate, h, and a file for removing the side of the point, substantially as specified.

64,965.—LAMP BURNER.—John A. Frey, New York City.

I claim the combination of the air chambers, f and g, with the air inlets, d d, and perforated diaphragm c arranged and operating as and for the purpose set forth.

64,966.—MACHINE FOR SIZING AND FELTING HATS.—E. R. Gardiner, Brooklyn, N. Y.

I claim the combination with the inclined endless belt or apron, C, of the inclined adjustable or self-adjusting partly submerged bed, F, and box or bath, A, substantially as and for the purpose or purposes herein set forth.

64,967.—GANG PLOW.—T. Elzare Gardiner, Bryantown, Md.

I claim a gang plow, constructed and operating in the manner substantially as shown and described.

64,968.—GUIDE FOR SEWING MACHINES.—George D. Garvie, Hartford, Conn.

I claim the adjustable gage, B, in combination with the spring arm, a, both being constructed and arranged as described.

64,969.—ATMOSPHERIC CHURN DASHER.—J. C. Gaston, Cincinnati, Ohio.

I claim the tubular handle, A, provided with the perforation, b, near the upper end, a, in combination with the dash board, c, having the annular concavity, c', in its lower face, all constructed and operating substantially as herein described and for the purpose set forth.

64,970.—BRIDLE REIN.—A. E. Graham, Richland, Ind. Antedated November 21, 1866.

I claim the continuous reins, A A, passing through pulleys on the ends of the bit, and also through pulleys each side of the gag rein, and around the terret or check hook, being tacked together (as seen at x), or prevented by a keeper from sliding through said check hook, substantially as described and for the purposes herein specified.

64,971.—CHURN.—Adelbert W. Gray, Bennington, Ohio.

I claim the special arrangement of the break, C, in combination with the beater, H, when operated conjointly, in the manner and for the purpose set forth, by means of the band, I, pulley, K, and wheel, J.

64,972.—RECIPROCATING ENGINE.—William D. Grimshaw, Newark, N. J.

I claim the combination, with a reciprocating piston, of a cushioning attachment, operating as a sliding or movable plug to the port or ports of the cylinder, substantially as specified.

64,973.—BED BOTTOM.—C. H. Hall, Binghampton, N. Y.

I claim the arrangement of a series of springs, C, each having three or more coils, which are placed on pins, D, and on the end of the slats, B, substantially in the manner and for the purpose shown and described.

64,974.—PLOW.—H. G. and E. L. Hall, Putnam, Ohio.

We claim, First, The detachable side plate, B, of the plow point, A, substantially as and for the purpose specified.

Second, The cutting point, C, composed of a wrought-iron shank, c, and a cast or chilled-iron cap, c', substantially as and for the purpose described.

Third, The method above described of attaching the side plate, B, to the plow joint, A, by means of shouldered pins, b' b', projecting from the side plate, B, into slots in the body of the plow point, where the shoulders of the pins rest on ledges or keys in the walls of the slots, substantially as and for the purpose specified.

Fourth, The method of attaching the shank, c, to the plow point, A, above described.

Fifth, The independent cutter or coulter, H, substantially as and for the purpose described.

Sixth, The construction of the cutting point, C, and the groove or bed, a, as above described, so that the cutting point may be self-sharpening, substantially as and for the purpose specified.

64,975.—DOOR LOCK.—W. J. and J. W. Harris, Newport, N.Y.

We claim, First, In combination with the key for arranging the tumblers, the eccentric or slide for moving the lock bolt, substantially as described.

Second, In combination with the slide, the stops against which it impinges or brings up at the exact point in both the locked or unlocked positions for the admission and withdrawal of the key, substantially as described.

64,976.—WINDOW-SASH WEIGHT.—H. A. Harvey, New York City.

I claim the new article of manufacture herein described, namely, a sash weight, composed of a metallic case filled with iron ore and cement, manufactured as herein set forth.

64,977.—TURBINE WATER WHEEL.—Birdsill Holly, Lockport, N. Y.

I claim sustaining turbines and other wheels by means of a water chamber, H, and disk, F, resting directly upon the sides thereof, both surrounding the step and shaft of the wheel when supplied with water from the flume, and proportioned to the hight thereof, substantially as set forth.

I also claim, in combination with said device, the supply pipe, I, arranged for receiving the water from the outside of the stop gate, J, substantially in the manner and for the purpose set forth.

64,978.—DEVICE FOR PERFORATING CIGARS.—J. Houghton, New York City, and G. Wingfield, Brooklyn, N. Y.

We claim, First, The combination of the needles, a, head, A, casing, B, spiral spring, b, ring, d, and piece, C, substantially as and for the purpose set forth.

Second, The combination with the head, A, and needles, a a, with the casing, B, substantially as and for the purposes set forth.

Third, The combination with the head, A, and needles, a a, of the conical piece, C, having a trumpet-shaped or conical opening in it, substantially as and for the purpose specified.

Fourth, The combination with one or more needles, a a, head, A, and casing, B, of the spiral spring, b, substantially as and for the purpose set forth.

64,979.—BROOM HEAD.—William G. Hughes, Hebrow Ind. Antedated May 8, 1867.

I claim, First, The combination of the wire braces, I and J, with the parts, A and B, and with the brush of the broom, substantially as described and for the purpose set forth.

Second, The combination of the spring or bracing wires, M and N, with the wire braces, I and J, and the brush, P, substantially as described and for the purposes set forth.

64,980.—TOBACAO CUTTING MACHINE.—W. W. Huse, Brooklyn, N. Y.

I claim arranging or hanging the circular cutter eccentrically upon its shaft, so that only a portion of its cutting edge is at one operation brought into action on the tobacco or other material to be cut, and when desired, can be shifted on its shaft to bring another portion of its cutting edge to act on the substance to be cut, as described.

I also claim making the cutter for a short distance from its periphery or cutting edge, inclining outward from its plane of motion as herein described in combination with the method of hanging the cutter eccentrically and so that it can be shifted on its shaft as described.

And I also claim in combination with the eccentric cutter, the employment of a sharpener and wiper, arranged substantially in the manner and for the purposes set forth.

64,981.—SEEDING CULTIVATOR.—Henry Hutchison, Three Rivers, Mich.

First, I claim the reversible cross shaped marker, O, constructed, arranged and operating as described.

Second, The reversible rhombohedral spades, R, constructed, arranged and operating as described.

Third, The reversible winged covering plows, U', constructed, arranged and operating as described.

Fourth, Adjusting and holding the shades upon the legs or shovel stocks by means of the hinged clamps and set screws, constructed and arranged as described.

Fifth, The combination of the hinged slotted legs with the pivoted drag bars having hooks on their rear ends to pass through the slots and be held by wooden pins behind the legs when constructed, arranged and described.

Sixth, The combination of the marker and front plows with the shifting bar, P, shifting lever, P', and drivers seat, when arranged for joint operation as set forth.

Seventh, The combination of the legs with their supporting beams by means of the laterally adjustable sockets, forks, lugs, and set screws, constructed, arranged and operating as described.

Eighth, The combination substantially in the manner described of the front and rear plows mounted on opposite ends of levers pivoted to rock transversely, to the axle to relieve the strain on the plows caused by inequalities in the surface of the ground.

Ninth, The combination of a series of front and rear plows with longitudinal rocking levers fulcrumed on transverse levers so connected at their inner ends that the levers can simultaneously be raised or lowered by the driver or be held in any position desired.

Tenth, The combination of the covering plows attached to the beam suspended from the rear end of the rocking levers with the lateral vibratable front plows suspended from the front end of the rocking levers.

Eleventh, The combination of the lifting levers, sliding bar, V, and detent, v, when arranged in relation to the drivers seat, substantially in the manner described.

Twelfth, The arrangement of the adjustable drivers seat, arched bar and adjustable back brace as described.

Thirteenth, The arrangement of the hoppers, E' and F, as and for the purpose described.

Fourteenth, The combination with the feeding hopper, E', of the reciprocating teeth, m, and rubbers, m', for the purpose of separating the seed.

Fifteenth, The combination with the lower hopper of the reciprocating toothed feeding slides.

Sixteenth, The vertically reciprocating gates, J, arranged and operating as described.

Seventeenth, The combination substantially in the manner described of a hopper, a horizontally reciprocating toothed slide and a vertically reciprocating gate.

Eighteenth, The combination of the hopper the reciprocating slides, the feed spout and the marker, for the purposes set forth.

64,982.—STATIONARY WASH BASIN.—Alfred Ivers, New York City.

I claim the pendant flange, d, and slot, e, in combination with the dam, i, and pipe, g, substantially as and for the purposes specified.

64,983.—SHEEP RACK.—Heber G. Ives, Dunham, Conn.

First, I claim pivoting the hay rack of a sheep feeding device so that by adjusting or turning the same, the trough beneath may be exposed to facilitate cleaning, substantially as described.

Second, I claim the combination with the racks, C C, of two troughs, F F, having their contiguous inclined sides joined together at top at an angle for the purpose of distributing the grain or roots, substantially as set forth

64,984.—HARVESTER.—Luman H. and George J. Jones, Barrington, N. Y.

We claim the arrangement of the several parts, B C D E G J K L and M when made and applied as and for the purposes herein specified.

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64,985.—HARVESTER PITMAN.—Jacob L. Kintner, Harrison county, N. Y.

I claim the grooved adjustable journal boxes, B B, frame, A, and packing, E F, combined and arranged with the cutter bar, D, pitman, E, and wrist pin, C, in the manner and for the purposes herein specified.

74,986.—ORGAN.—George B. Kirkham, New York City.

First, I claim the connections, a a, their nuts, screws, and blocks, d e, together with their pin screws, and little ball supports, c.

Second, I claim the lips. f f, and their guides, g g.

Third, I claim the spring catch, h, and its attachments, i j k l m n and o, including the arrangement, p and q.

Fourth, I claim the bar, b, and its supports, b' b' as shown and set forth.

Fifth, I claim the combination, s r t u v, as described and represented.

Sixth, I claim the peculiar hinge joint made by the sticks, T Y and Z, with little pins passing through the sticks.

64,987.—GATE.—Albertus Larrowe, Cohocton, N. Y.

I claim the combination and arrangement of the gate, as herein described, with the post, C, having the rabbets, e e, and roller, g, and post, B, with slot and catch, t, in the manner and for the purposes set forth.

64,988.—WINDOW-SASH ELEVATOR.—John Le Ferre, Charlestown, Mass.

I claim the hinged plate, C, with its projections, a, eyes, c d, and screw, D, in combination with the block, G, provided with its screw thread, f, and carrying the pulley, e, substantially as and for the purpose set forth.

64,989.—TIME GLOBE.—L. Paul Juvet, Glenn's Falls, N. Y.

First, I claim the axis of the globe, A, when constructed of the two sections, F and F', the former serving as an axis for the hollow arbors, o and p, carrying the hour and minute hands, d and b, and the latter serving as a winding arbor, constructed, arranged, and operating in the manner substantially as shown and described, and for the purpose set forth.

Second, The combination of the dial, D, globe, A, and the chronometer movement within the same, arranged, constructed, and operating in the manner substantially as shown and described and for the purpose set forth.

64,990.—MODE OF AGEING ALCOHOLIC LIQUORS. — Joseph Lloyd Martin, Baltimore, Md.

I claim, First, The process herein described for changing, altering, and modifying whiskey, brandy, gin, or other alcoholic liquors, so as to give them the character and quality of similar liquors as usually acquired by long keeping.

Second, The combined action of heat, electricity, and attrition, so as to modify and change alcoholic liquors, substantially as herein described.

Third, The combination of an electric battery, pump, and tanks, or their equivalents, so as to treat alcoholic spirits, substantially as herein described.

64,991.—SHEEP SHEARS.—Ebenezer Mathers, Elderville, Pa.

First, I claim making sheep shears with reversable blades for cutting or clipping whether each blade or set of blades be made in one piece or in two or more pieces, substantially in the manner and for the purposes above set forth.

Second, The mode of attaching the handles, a a', of a pair of sheep shears by a spiral or coiled spring, b, so as to admit of their easy operation, such spring possessing sufficient rigidity to cause the return stroke of the blades, substantially as and for the purposes hereinbefore set forth.

Third, Securing a more or less intimate contact between the opposite blades or sets of blades of a pair of sheep shears, by a set screw passing through a slot in one of the blades or the plate to which such blade is attached, and screwing into the other, substantially as and for the purposes above described.

64,992.— INSTRUMENT FOR PREVENTING INCRUSTATION OF STEAM BOILERS.—David Matthew, Prairie du Chien, Wis.

I claim the employment within the boiler or cage or case, containing metallic scrap, substantially as described.

64,993.—HEATING APPARATUS.—T. A. McFarland, Meadville, Pa.

First, I claim the combination substantially in the manner described, of the fire chamber, the water chamber, and the steam chamber, with the casing or body of the stove, for the purpose set forth.

Second, Connecting the water and steam chambers by the steam and waste water pipes, arranged as described, for the purposes set forth.

Third, The valve, F, arranged to operate as a safety valve for the boiler, and as a return valve for the condensed waste steam, as described.

64,994.—BRICK.—Samuel McLaughlin, Philadelphia, Pa.

I claim bricks having ribs and grooves arranged substantially as and for the purpose herein set forth.

64,995.—MANUFATURE OF PACKING FOR STUFFING BOXES FOR STEAM ENGINES, PUMPS, ETC.—Wm. Hartley Miller, Philadelphia, Pa.

I claim the combination of these materials in a packing for engines, pumps, etc, in the manner shown and described.

64,996.—POTATO DIGGER.— Adam Minnis, Canton, Township, Mich.

First, I claim the whole combination of the machine, for the use and purposes named.

Second, I claim as new the shears, A A, etc. five or more, in shape and manner of adjustment.

Third, I claim as new the flexible knives, E E, etc., in the manner of their adjustment.

64,997.—HAWSE PIPE.— Parker Moody, Gloucester, Mass.

I claim the arrangement and combination of the auxiliary concave roller, D, and its chamber, b, with the hawse pipe, A, its oblique mouth piece, B, and the concave friction roller, C, arranged in such mouth piece, substantially as specified.

I also claim the cambination and arrangement of the dovetailed plates, d d, and recesses, e e, with the hawse pipe and its auxiliary roller, D, and roller chamber, b, as described.

I also claim the construction of the roller chambers with discharging passages f g h, having therefrom and communicating as described.

64,998.—COMBINED PRESS FOR CHEESE AND FOR OTHER PURPOSES.—Christian Musselman, Somerset, Pa.

I claim the arrangement of the lever, d, winch, f, platform, a, and rings and cylinders, l i k m o, in the manner and for the purposes set forth, the whole forming a press adapted to domestic uses.

64,999.—BREECH-LOADING FIRE-ARM.—Joseph and George Henry Needham (assignors to James G. Gray), (London, Eng.

We claim the arrangement of the breech piece, i, with its component parts, constructed and operating substantially in the manner described.

65,000.—MACHINE FOR MAKING TYPE MOLDS. — Mortimer Nelson, New York City.

First, I claim a wheel receiving in radial grooves movable types in combination with a lever and with projections on said wheel, substantially as set forth, whereby the lever that moves the type is also made to accurately adjust the wheel and hold it while the type is being impressed, as set forth.

Second, I claim a vertical wheel carrying movable types placed radially and constructed substantially in the manner specified.

Third, I claim the barrel, C, in combination with the type wheel, A. and keys, F, substantially as and for the purposes set forth.

Fourth, I claim the feed wheel, Z, rack, A, beds, S' and S, constructed and operated in substantially the manner and for the purposes set forth.

Fifth, I claim the spacing block, E2, and its actuating mechanism, applied substantially in the manner and for the purposes set forth.

Sixth, I claim the lever, W, in combination with the spacing block, E S, and feeding mechanism, substantially as specified.

Seventh, I claim a contractile band to draw the type back to place in the type wheel, as set forth.

65,001.—SHINGLE MACHINE.—Elijah R. Osgood, Columbus, Ohio.

First, I claim the manner shown and described of constructing the movable dogs of two parts, e e', jointed together and held so by a plate, substantially as described.

Second, The arrangement of the tripping toe, k, and a spring arm, j, acting upon an oscillating shaft, h, to which the extension arm, H', of said table is attached, all constructed and operating substantially as described.

Third, The spring arm, j, in combination with the rock shaft, h, and tripping toe, substantially as and for the purpose described.

Fourth, The combination of the forked arm, H', of the bolt table, H, oscillating shaft, h, adjustable block, g, and saw, D', substantially in the manner and for the purpose described.

Fifth, The arrangement of the wheels, a a, internally toothed plate, A A', spur wheel, C, shaft, C', saw and shaft, D D', belt, b, central shaft, E, cam, c, retractor, I. dogs, e e, curved way, G, spring arms, d d, and pivoted table H, all constructed and operating substantially in the manner described.

Sixth, The arrangement of the circular internally toothed plate, A A', oscillating bed, H H', saw, D, cam, c, retractor, I, dogs, e e, spring levers, d d, blocks, g g', rock shaft, h, spring arm, j, tripping toe, k, loaded arm, m, and weighted arm, l, w, all constructed and operating substantially in the manner and for the purpose described.

Seventh, A circular sawing machine constructed and operating on the principle herein described which is capable at the will of the operator of being made to saw stuff of equal or unequal thicknesses, substantially as set forth.

65,002.—COMPOSITION FOR INK.—Bernard Owens, St. Louis, Mo.

I claim the composition or like composition as above named and described and for the purposes set forth or any other substantially the same for the purposes set forth and to produce the above-named effect.

65,003.—STEAM ENGINE.—Horatio O. Perry and John L. Lay Buffalo, N. Y.

We claim the combination and arrangement of the shell or frame constituting the intervening chamber, K, with the two cylinders, A and B, and continuous piston rod, F, its bottom plate forming the cover of the cylinder, B, constructed substantially as and for the purposes herein set forth.

We also claim the stuffing box consisting of the sleeve, h, and packing box L, in combination with the chamber, K, and piston, F, and cylinders, A B, arranged and operating substantially as and for the purposes set forth.

We further claim the combination and arrangement of the manhole, I, with the bottom plate of chambers, K, forming the head of the cylinder, B, whereby the adjustable ring M, and sectional packing rings, r s, of the piston, B may be removed, substantially in the manner and for the purposes herein set forth.

65,004.—HOG FEEDER.—I. S. Pope, Napoleon, Ohio.

First, I claim the wheel, G, as arranged in combination with the box, A, and trough, B, as and for the purpose described.

Second, The valve, K, as arranged and operated by the lever, L, in combination with the reservoir, I, and trough, for the purpose and in the manner as set forth.

65,005.—VAPOR BURNER.—Alonzo W. Porter and J. Hamilton Brown (assignors to Alonzo W. Porter and James S. Gray), New York City.

First, We claim mounting the heater cap and conductors on a plug having a ground edge fitting into a corresponding ground surface on the top of the retort, substantially in the manner described for the purpose of readily separating the heater cap from the retort to cleanse the latter.

Second, The combination substantially in the manner described of a locking yoke embracing the retort with a detachable plug supporting the conductors, for the purpose set forth.

Third, The combination of the retort, the central pipe, and the valve stem with the sleeve screw and yoke, for the purpose specified.

Fourth, A yoke which embraces the retort and serves both to lock the parts together and as an additional heat conductor.

65,006.—MACHINE FOR CUTTING TOBACCO.—E. L. Pratt, Boston, Mass.

I claim the swinging carrier, the cutter, and the gage plate, when arranged to operate together substantially as shown and described.

65,007.—FURNITURE FOR VESSELS.—Samuel F. Pratt, Roxbury, Mass.

I claim the combination of the seat and water-tight tank, when constructed and arranged to operate substantially as and for the purpose specified.

Also in combination with the foregoing, of one or more water-tight compartments, as and for the purpose specified.

65,008.—LOCOMOTIVE ENGINE.—Lucier Raichaert, Paris, France, assignor to Richard and Henry L. Norris, Philadelphia, Pa.

First, I claim a locomotive engine having a main driving shaft with a crank formed in the same turning in fixed bearings secured to the frame and situated between two trucks each of which has a cranked axle coupled to the said main driving shaft, all substantially as and for the purpose herein set forth.

Second, The combination of the said main driving shaft, E, the cranked axles of the trucks, and coupling bar, J, the several shafts and their cranks being arranged substantially as described.

Third, The bars, F and F', constructed and adapted to the main driving shaft and cranked axles of the trucks, substantially as and for the purpose herein set forth.

65,009.—AUTOMATIC WATER LEADERS.—Henry Reuch, Quincy, Ill.

I claim the spring, N, in combination with the valve, I, spring case, P, discharge pipe, J, and weight linked to the valve, all arranged substantially as described.

65,010.—LAMP HEATERS FOR VEHICLES.—Edwin H. Reynolds, Rising Sun, Md.

First, I claim a casing, B, having a perforated top, a, side openings, b, partition, G, and outlets, d, in combination with a detached lamp, the whole being constructed and applied to the bottom, A, of a vehicle, substantially as and for the purpose described.

Second, The combination of the above-mentioned casing, B, with a glass lamp chamber.

Third, The shields, n n, arranged beneath the tubular projections, d d, substantially as and for the purpose specified.

65,011.—VAPOR BURNER.—H. M. Richmond, Buffalo, N. Y.

First, I claim the combination of the transparent cone or deflector, A, with the inner cone, B, of a gas generating burner.

Second, In combination therewith I claim the flange, F, with the grooves, H and G, or the equivalent thereof, as and for the purposes described.

65,012.—TRACTION ENGINE.—John B. Root, New York City.

I claim the combination of variable or adjustable eccentrics or cranks on a rotating shaft driven by the engine, with reciprocating friction blocks or devices acting upon the wheels connected with the driving shaft of a locomotive or traction engine, substantially as specified.

65,013.—ROTARY VALVE.—John B. Root, New York City.

I claim the combination with a valve the face of which moves in the arc of a circle or arcs of circles, of a driving pin, G, projecting radially from the valve operating rock shaft and made cylindrical at its junction with the valve and to loosely fit or enter a cavity in the valve, substantially as and for the purpose or purposes herein set forth.

65,014.—CHURN.—W. W. Sanborn, Lyons City, Iowa.

I claim the perforated beater, H, the air tube, K, and the grooved bottom, J, when constructed, arranged, and operating substantially as and for the purposes above set forth.

65,015.—SASH SUPPORT.—John N. Sawtell, Chicopee, Mass.

I claim in a sash supporter the combination of the wedge, C, lever, E, and guide box, A, the whole constructed and operating substantially as described.

65,016.—VENTED FAUCETS.—Henry Schild and Jacob Schild, New York City.

We claim the valve, f, at the inner ends of the channels, j k, in combination with the elbow lever, b, and tooth, c, of the plug, B, constructed and operating substantially as and for the purpose described.

65,017.—ATTACHING CARRIAGE THILLS.—Gottlieb Schreyer, Columbus, Ohio.

First, I claim the construction, upon a clip strap, B, of a perforated lug, D, with a conical enlargement, b b, on its sides, adapted for receiving the slotted thill iron, E, and a bolt, G, substantially as described.

Second, The construction of the clip strap, B, with lips, c c, for holding rubber blocks, d d, and also with a perforated lug, D, having conical enlargements upon it, substantially as described and for the purpose set forth.

Third, The combination of the slotted thill iron, E, conical lug, D, and a tapering bolt, G, substantially as described.

65,018.—STEAM-GENERATOR GAGE COCK. — Thomas Shaw, Philadelphia, Pa.

I claim the construction and arrangement of the gage valve and whistle whereby to control the pressure, and to indicate the sound produced by steam, or steam and water commingled, or water unmingled with steam, substantially as set forth.

65,019.—INSULATING SUBMARINE CABLES.—George B. Simpson, Washington, D. C.

I claim the combination of gutta percha and metallic wire in such form as to incase a wire or wires, or other conductors of electricity, within the non-conducting substance gutta percha, making a submarine telegraph cable at once flexible and convenient, which may be suspended on poles in the air, submerged in water, or buried in the earth to any extent, for atmospheric and submarine telegraph communication, and for other electric, galvanic, and magnetic uses, as hereinbefore described.

65,020.—BEEHIVE.—Nathan Simpson, Pomeroy, Ohio.

I claim applying and arranging around the entrance to the beehive needles or other sharp pointed pieces of metal, substantially as set forth, and for the purposes stated in the foregoing specification.

65,021.—SLEIGH BRAKE.—Henry Sipe, Sipesville, Pa.

I claim the rock shaft, b, and arms or elbow levers, c c, in combination with the brake bars, d d, and pole or tongue, a, arranged and operated substantially as described.

65,022.—TOY.—George W. Sizer, Brooklyn, N. Y.

I claim the combination of one or more whistles with the toy known as the buzz, substantially as herein set forth.

65,023.— PADDLE WHEEL. — E. Spencer, Ottawa, Canada West.

I claim the pivoted buckets, I, provided with the cams, b and h, and arranged to operate in connection with the stationary ring, B, having the notches, n, and projections, c, formed thereon, substantially as shown and described.

65,024.—CONCRETE BRICK MACHINE.—James Stewart, and David Windsor, Sandwich, Ill.

First, We claim the combination and arrangement of the molds, B B, plungers, C C, following bar, E, arms, H H, I I connecting arms, L L, and shaft, N, substantially as and for the purposes specified.

Second, We claim in combination with the above, the arms, F F, and lever, G, arranged as and for the purposes described.

65,025.—FENCE.—Jonathan Thomas, Mount Union, Ohio.

First, I claim the combination of the horizontal wires, C C, with strips, B B', looped around them substantially as shown and described.

Second, I claim the posts, A, constructed of bar iron in U form with the flanges at bottom to adapt them to be bolted to a base, substantially as described.

Third, The springs, J J, adapted and employed to operate substantially as and for the purpose set forth.

65,026.—CATTLE PUMP.—Harris W. Thornburg (assignor to C. W. Morrison), Morristown, Ind.

First, I claim the circular platform, A, in combination with shaft, R, when said shaft is arranged by means of slot, t, that the pumping apparatus will adapt itself to the weight of the animal, substantially as set forth

Second, Spring, F, provided with friction rollers in combination with the tilting platform, A, as and for the purpose described.

Third, The circular or tilting platform, A, shaft, R, slotted head block, B, cam wheel, K, and lever, m, all arranged substantially as and for the purpose specified.

65,027.—BOOT AND GAITER STRAP. — William J. Turner, Utica, N. Y.

I claim the boot or gaiter strap, constructed and operating substantially as described.

65,028.—BED BOTTOM.—Charles Weed, Boston, Mass.

I claim the spring support made of one long and two short slats, when these are combined through the medium of stationary fulcra, and springs adjustable relatively to said fulcra, as means for graduating the yielding resistance of the support, substantially as described.

65,029.—BRUSH.—A. M. White, New York City.

I claim the enlarged chambers, a', of the holes, a, in combination with the staple-like wires, b, substantially as and for the purpose specified.

65,030.—HARVESTER RAKE. — William N. Whiteley, Jr., Springfield, Ohio.

First, I claim driving the rake and reel directly by means of a worm screw on the cutters crank shaft, and a worm gear on one end of the reel shaft, substantially as shown and described.

Second, The quadrant-shaped dropping platform, P, hinged to the finger bar, substantially as and for the purpose set forth.

Third, The combination of the quadrant-shaped platform, P, with the rake, G, arranged to operate in conjunction with said platform, substantially as described.

Fourth, The combination of the rake, G, the cam, F, and quadrant-shaped dropping platform, P, so arranged that the dropping of the platform is dependent upon the movement of the rake, substantially as described.

Fifth, In combination with the dropping platform, P, and rake, G, the stop, O, substantially as and for the purpose set forth.

Sixth, The combination of the clutch lever, L, and the stop lever, M, substantially as and for the purpose set forth.

Seventh, The combination of the cam, F, lever, S, and dropping platform, P, substantially as and for the purpose set forth.

65,031.—HORSE HAY FORK.—Michael Winsler, Wm. Campbell, and Lyman Hardman, Tuscarawas County, Ohio.

We claim the fork, A and B, when constructed and operated in such a manner that the point of the outside tine of each fork will come in contact with the point of the inside tine of the other fork, substantially as and for the purpose herein set forth.

65,032.—MANUFACTURE OF BROWN METALLIC PAINT.—Peter Winter, Horicon, Wis.

I claim the brown metallic paint, manufactured from the substance popularly known as dead or shot iron ore, consisting mainly of peroxide of iron and manganese, when treated substantially as herein shown and described.

65,033.—VALVE FOR STOVE-PIPE DAMPER.—Gaius B. Wiseman, Sycamore, Ill.

First, I claim a folding damper valve, composed of the leaves, B C D, operated by a sliding stem, A, the whole constructed substantially as set forth and described.

Second, The folding and revolving damper valve, constructed and operated substantially as set forth and described.

65,034.—WATCH.—Charles V. Woerd, Waltham, Mass.

I claim, In combination with the wheels, c, and means for rotating the same, the lever, b, provided with the wheel, d, when arranged to operate substantially as described.

Also, in combination with the lever, b, and wheel, d, a spring catch, latch pin, and stops, substantially as and for the purpose described.

65,035.—MACHINE FOR MAKING EYELETS.—Solomon W. Young (assignor to himself, J. W. Hoard, and R. A. Denison), Providence, R. I.

I claim the combination as well as the arrangement of the feeding mechanism, the dies, i l, the punches, m n, and mechanism for operating such punches substantially as described.

I also claim the die plate as made with the guide groove, h, and the gage cavity, k, arranged with the dies, i l, substantially as described.

65,036.—MACHINE FOR MAKING EYELET STOCKS.—Solomon W. Young (assignor to himself, J. W. Hoard, and R. A. Denison), Providence, R. I.

First, I claim the die plate as constructed with the groove or channel, b, and the depression, e, as and for the purposes set forth.

Second, I also claim the combination of the retainer, H, with the die and the punch, or the same and the guide channel, such retainer to operate with the punch, substantially as specified.

Third, I also claim feeding apparatus made substantially as described.

Fourth, I also claim the combination as well as the arrangement of such feeding apparatus, or its equivalent, with the punch and die and the retainer, as specified.

Fifth, I also claim the combination of the feeding apparatus, the punch and die, the retainer and the guide channel, to operate as specified.

Sixth, I also claim the combination as well as the arrangement of either or both the guide staples, with the die plate, the punch, and the feeding mechanism, as explained.

Seventh, I also claim the combination of the roller, f, the guide channel, the retainer, the punch, and die, one or more staples, and the feeding mechanism.

RE-ISSUES.

2,616.—MACHINE FOR GUMMING AND PRINTING ENVELOPES.—Henry C. Berlin and George H. Jones, New York City, assignors of Thomas V. Waymouth. Patented June 12, 1866. Reissued Sept. 25, 1866.

First, I claim the construction and operation of the hinged table B, substantially as and for the purpose set forth.

Second, The operation of the movable separator G, or its equivalent in combination with the gummer D, substantially as and for the purposes set forth.

Third. The combination of the gummer D, and reciprocating carrier F, or its equivalent and the endless apron H, or its equivalent, arranged and operating substantially as and for the purposes set forth.

Fourth, Imparting an intermittent motion by suitable mechanism to the endless apron H, or its equivalent, when combined with a reciprocating carrier F, and gummer D, for the purpose set forth.

Fifth, The operation of the rollers k', and finger l', separately or together in combination with the endless apron H, and carrier F, substantially as and for the purposes set forth.

Sixth, Gumming the seal flap of an envelope or similar blank by a gummer, which performs the double office of gumming the blank and raising or holding it stationary in combination with any suitable mechanism to receive the blanks, one after another after they have been gummed and carry any such blanks so gummed in such a manner that the gummed portions will be prevented from lying upon or overlapping each other, while drying, for the purpose set forth.

2,617.—PHOTOGRAPHIC ALBUM.—William W. Harding, Philadelphia, Pa., assignee by mesne assignments of Richard Van Velthoven and Joseph H. Hazzard. Patented Oct. 17, 1865.

I claim the binding of the sheets or cards of albums together by means of strips of leather or muslin, or their equivalents pasted or secured to the edges of contiguous or alternate sheets successively through the book.

2,618.—COOKING APPARATUS AND REFRIGERATOR.—Ignaz Newburg, New York City, assignee of Joseph and Ignaz Newburg. Patented Nov. 6, 1866.

I claim the non-conducting packing or material, composed of pasteboard boxes fitted one within another, substantially as herein set forth for the purpose specified.

Second, The double casing a b, and non-conducting material c, having an annular gutter m, openings i, opening g, and pan f, and furnished with the non conducting cover A, in combination with the central vessel B, the whole constructed and arranged substantially as herein set forth for the purpose specified.

2,619.—PAPER CUTTING MACHINE.—William Smith, South Windham, Conn., Executor of the estate of Enos P. Beckwith, deceased.—Patented Dec. 19, 1865.

First, I claim the employment in a paper cutting machine of a combination of two elements, to wit, a feed mechanism impelled by a motion intermittent which starts and stops the feed gradually, and a frictional connection, which allows a returning motion of the impelling mechanism, while the feed is at rest, and takes hold of and releases the feed at any point, without the lost motion due to ratchets, and the like toothed connections; all substantially as and for the purpose herein specified.

Second, The combination in a paper cutting machine, of a revolving knife, with a gradually starting intermittent feed mechanism, substantially as and for the purpose herein set forth.

Third, The within described arrangement of the revolving knife b, crank B2, link D, connecting means E, and intermittent feeding drum G, substantially as and for the purpose specified.

Fourth, In combination with mechanism, substantially as herein described for feeding forward and arresting the motion of the paper, I claim adjusting the length of the sheets by changing the position of the link D, or its equivalent, substantially as and for the purpose herein set forth.

Fifth, The pendulous piece C, arranged relatively to the knives a, and b, to the gradually stopping and starting mechanism, G H, or its equivalent in a paper cutting machine, substantially as and for the purpose herein specified.

Sixth, The spring K, arranged as specified relatively to the intermittent feeding mechanism E F G, and their connections, in a paper cutting machine.

Seventh, Taking hold of the feed roller so as to prevent its revolving backward when the forward motion is arrested in combination with the feed, having an alternated reversed motion, and gradually starting and stopping, as herein specified.

Eighth, The within described construction and arrangement of the brake M, so as to aid in arresting the forward motion at the proper time as well as to prevent the backward motion.

Ninth, The within described arrangement of the spring J, brake M, wheel G', and the connected parts of an intermittent feed in a paper cutting machine, substantially as specified.

Tenth, The catch or dog N, with a releasing device therefor in combination with the brake M, spring J, and suitable means for depressing the same, and the intermittent feeding drums G H, or their equivalents, in a paper cutting machine as specified.

Eleventh, The detaching cam B5, and surface N, brake M, and wheel G', of an intermittent feed in a paper cutting machine, substantially as specified.

2,620.—HARVESTER RAKE.—Robert Bryson, Schenectady, N. Y. Patented April 8, 1862.

First, I claim the combination of the vertical shaft E, angular guide bar I, rake head J, slotted arm F, connecting rod H, vibrating lever G, and crank B, substantially in the manner and for the purpose described.

Second, The combination of the many sided block K, rake head J, spring L, inclined lugs N N', loaded lever hook M, and loaded tripping hook levers, O O, the whole being constructed to operate substantially as described.

Third, In combination with a platform hinged to a draft frame having two supporting and driving wheels, I claim a circularly sweeping rake arm or handle, which moves in a plane parallel to the plane of the hinged platform, on a pivot which is on said platform; and which also receives an intermittent

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oscillating motion about its own axis; when the support of such rake arm is located at or near the rear end of the platform which is attached directly to the finger beam, substantially as and for the purpose described.

Forth, I claim a hinged platform with a vibrating rake mounted upon it, said rake moving in the plane of the top of the platform while sweeping off the grain and then oscillating on its own axis so as to move back above the grain which is to be swept off by it in its return forward stroke, substantially as herein described.

Fifth, A rake arm which sweeps in the path of a part of a horizontal circle, oscillates in the path of a vertical circle, all without changing its attitude at any point, such rake arm being mounted on a platform which is hinged to the draft frame, and which is directly behind the cutting apparatus, substantially as described.

Sixth, A hinged platform with the elevated extension D, adapted for sustaining a rake which delivers the cut grain in gavels upon the ground in rear of the draft frame, substantially as described.

Seventh, A hinged platform with a rake arm J, which is provided with a latching device, said latching device moving with the rake arm in its passage over the platform, and acting to hold the teeth of the rake arm in a position for raking, and also in a position for passing unobstructedly over the grain upon the hinged platform, substantially as described.

Eighth, A rake which has both a circular vibrating movement and an intermittent oscillating movement, all without changing the plane of the rake arm mounted on a platform which is hinged to a two wheeled draft frame, substantially as and for the purpose described.

Ninth, A rake which has both a circular vibrating movement and an intermittent oscillating movement about its own axis all without changing the plane of the rake arm; such rake being mounted on a hinged platform and driven by a crank and pitman, from the inner side of a draft frame which has two separate and independent driving and supporting wheels, substantially as described.

2,621.—MANUFACTURE OF BLACK LEAD CRUCIBLES.—George Nimmo, Jersey City, N. J. Patented May 31, 1864.

I claim the manufacture of crucibles from a composition of which calcined plumbago or old pots ground, forms a part, substantially as set forth.

DESIGNS.

2,655.—DESIGN FOR A COOK'S STOVE.—John Abendroth, New York City.

2,656.—DESIGN FOR A CARRIAGE LAMP.—Marcus DeVoursney, Newark, N. J.

2,657.—DESIGN FOR A SHAFT FRAME.—Adolph H. Rau, Philadelphia, Pa.

2,658.—DESIGN FOR A PIANO STOOL.—Henry M. Ritter, (assignor to M. Greenwood & Co.,) Cincinnati, Ohio.

EXTENSIONS.

ORNAMENTING BOTTLES.—L. Q. C. Wishart, Philadelphia, Pa. Design. Letters Patent No. 1,161. Dated Oct. 25, 1859.

I claim the ornamental design, described and represented in the drawing for Pine Tree tar cordial bottles.

SUPPORTING THE TOPPING-LIFT AND PEAK HALYARD BLOCK OF SAIL VESSELS.—William and Stephen G. Coleman, Providence, R. I. Letters Patent No. 9,619. Dated Oct. 25, 1859.

We claim the supporting the topping-lift by means of a crane, of such form, and construction, that when the topping-lift sags, when the sail is hoisted, it shall not foul or chafe against the peak halyard block.

We also claim the so arranging and constructing such crane that it may also support the peak halyard block, substantially as specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York, City. Reissued No. 269, dated July 4, 1854. Again reissued No. 698, dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim driving the pegs into boots and shoes automatically, by means of a peg driver operated up and down by a positive mechanical movement whether impelled by a cam, eccentric, or crank, or other equivalent, substantially as and for the purposes specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 699, (Div. 2.) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the moving the sole of the shoe along by means of the awl that forms the hole in which the peg is inserted, in combination with the peg driven, whether the peg driven be or be not employed to perform the additional function of presenting the peg, whereby each hole made by the awl is brought in succession in line for inserting the peg before the awl is withdrawn, as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 700, (No. 3) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim cutting off shoe pegs from a strip of peg wood, or other material, by means of a lateral or side cut, that will cut straight across substantially as and for the purposes set forth when combined with suitable ways in which the strip slides, and machinery for driving the pegs as specified.

I also claim enclosing the peg by the cutter until it is driven as specified, by making the cutter, when in position, a part of the guiding tube substantially as set forth.

I also claim the combination of the endless feed with a cutter for severing the pegs in a shoe pegging machine, as above specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 701, (No. 4) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim connecting the last with a horizontal slide or plate capable of presenting the shoe or boot, substantially as described, so that the shoe or boot attached thereto, may be turned and moved in any direction, in a horizontal or inclined course, in combination with a mechanism, substantially such as described, which tends constantly to force it upward against a rest or guide, but which will permit it to yield downward as described; but this combination I claim only when combined with the pegging mechanism above described, or any equivalent thereof.

And I also claim as an automatic means of moving and guiding the last to present it to the pegging apparatus, in the required line of pegging the guide groove and guide, and pinion and curved rack, substantially as decribed in combination with the mechanism above described or the equivalent thereof which permits the last to be moved in any desired direction as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 702 (No. 5) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the combination of the universal movement carriage, and lateral awl movement for properly presenting the shoe to receive the pegs in succession, as herein specified.

I also claim the combination of the mechanism for the cutting and feeding of the pegs, as herein described, or any equivalent therefor, with the automatic peg driver, as described.

I also claim the combination of the following elements, or their mechanical equivalents, namely, the peg-former, the peg-feeder, the peg-driver and the mechanism for moving the shoe, herein described, thus constituting an automatic machine for pegging shoes, as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 703 (No. 6) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the pegging of boots and shoes with nails or pegs drawn wire substantially as above described.

I also claim driving the pegs by means of the cutting nippers, said nippers cutting off the peg after it is driven, substantially as specified.

WEAVING CORDED FABRICS.—William Smith, New York City.—Letters patent No. 9,653. Dated April 5, 1853.

I claim the process of forming a fabric by the combination of stationary and movable warps with the two weft threads, passed simultaneously through the two sheds, formed above and below said stationary warps. The weft threads being held in place on the surface of the stationary warps by the movable warps.

SEWING MACHINE.—William Wickersham, Boston, Mass.—Letters patent No. 9,679. Dated April 19, 1853.

I claim the combination of a single needle and two thread guides (carrying separate threads) so operated that during one passage of the needle, through and out of the cloth, or other material to be sewed, one of the said guides, shall lay its thread in the hook of the needle, while during the next passage of the needle through and out of the cloth, the other guide shall lay its thread in the hook of the needle, each guide acting alternately, all substantially as herein before specified the improvement of making one of the said guides, viz: the guide I, with the long slot u, for receiving the thread in its passage to and through the other guide as specified.

I also claim the above described peculiar mode of sewing cloth, or other fabric, viz: by combining two threads with the fabric by drawing them through from the same side of the cloth and through each other's loops, interlooping them in plegma stitches so that the threads alternately bind each other substantially as specified.

The improved arrangement of applying the closing slide of the hooked needle, to the same side as the barb or hook, so that it may slide in a groove in the needle or carrier parallel to the motion of the needle, in the manner and for the purpose as specified.

BALANCING SLIDE VALVES OF STEAM ENGINES.—Robert Waddell, Liverpool, Eng.—Patented in England, April 27, 1853. Letters patent No. 10,999. Dated June 6, 1854.

First, I claim the equilibrium table with its ledges or their equivalents applied to and acting in combination with the valve substantially as herein described.

Second, I claim the packing pieces extending from the back of the valve chests and abutting against the back of the valve in combination with the small passages leading to the ports, substantially in the manner herein described.

Third, I claim combining the equilibrium table or its equivalent with the packing and small passages by the joint action of which a slide valve is perfectly and entirely balanced.

SEWING MACHINE.—William H. Johnson, Springfield, Mass.—Reissued No. 355, Feb. 26, 1856. Letters patent No. 10,597. Dated March 7, 1854.

First, I claim the making of a seam with a single thread, by the combination of a single needle, forked hook, and expanding lever, operating substantially in the manner and for the purpose herein specified.

Second, The forming or making of a seam from a single thread by the running of a loop of the thread through the material to be sewn, the running of a second loop through the material and putting the first loop through the second, the running of a third loop through the material and through the first-named loop, the carrying of a fourth loop through the material and putting the third through it, and so on, putting the first loop through the second and around the third, the third loop through the fourth and around the fifth, and so on, forming the belaying double loop stitch herein described, in the manner set forth.

Third, The feeding of the material to be sewn by means of a vibrating piercing instrument, whether said instrument be the needle itself or an independent instrument in the immediate vicinity thereof, substantially as herein described.

PROCESS FOR PREPARING GOLD.—Alfred J. Watts, Brooklyn, N. Y. Letters Patent No. 9,691. Dated April 26, 1853.

I claim the within-described process of preparing or crystalizing gold for the purpose of filling teeth, substantially as herein set forth and described.

KNITTING MACHINE.—John Mee, Lowell, Mass., assignor to John Mee and John Rourke, Lowell, Mass., and G. Mackennon, Portsmouth, N. H. Letters Patent No. 9,718. Dated May 10, 1853.

I claim two sets of thread guides in combination with two sets of needles (or their equivalents) and machinery for casting the loops, the whole being made to operate together substanttially as hereinbefore specified.

I also claim two sets of thread guides in combination with two sets of needles and machinery for casting the loops, all substantially as described, and operating together to produce a ribbed knit fabric, such as I have explained.

I also claim the improvement of causing the two sets of needles to work or move up and down independently of each other or in other words so that one set may move downward or be moved out of the way of the thread guides to be brought into operation on the other set, such improvement enabling me to bring or arrange the two sets of needles close together and thus make closer work than can be produced when the two sets of needles are made to move in one direction (either up or down) at the same time

WARP KNIT FABRIC.—Jno. of Mee, Lowell Mass., assignor to Jno. Mee and Jno. Rourke, Lowell, Mass, and G. Mackennon, Portsmouth, N. H. Letters Patent No. 9,719. Dated May 10, 1853.

I claim the above described new or improved manufacture of warp skirt ribbed fabric, the same being made by means of two sets of hooks or two sets of warps or warp yarns laid and looped together, and upon the said hooks or needles, substantially in the manner specified, and whether to exhibit ribs to equal or unequal widths on opposite sides of the fabric as explained.

MACHINE FOR SHRINKING HAT BODIES.—Jas. S. Taylor, Danbury, Conn. Letters Patent No. 9,700. Dated May 3, 1853.

I claim the process of shrinking or sizing the hat bodies by passing them longitudinally into and through a chamber formed by placing several cylinders or rollers having concave or other denomination of surfaces in such a proximity as to form the said chamber as hereinbefore substantially set set forth.

MACHING FOR POINTING AND THREADING SCREW BLANKS.—Thomas J. Sloan, New York City. Letters Patent No. 9,688. Dated April 26, 1853.

I claim combining in an organized machine, a cutter and its appendages operated substantially as specified for forming the point on screw blanks, as specified, with the chaser or cutter which cuts the thread over the shank and pointed part thereof down to the point substantially as specified.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,051.—MACHINE FOR CUTTING SCALE-BOARD, AND FOR THE MANUFACTURE OF THE SAME INTO AN IMPROVED FABRIC FOR STRUCTURES GENERALLY,—John K. Mayo, New York City. April 8, 1867.

1,053.—APPARATUS FOR REGULATING AND TRANSMITTING ELECTRIC CURRENTS, ESPECIALLY DESIGNED FOR USE IN CONNECTION WITH TELEGRAPHIC INSTRUMENTS FOR LONG SUBMARINE LINES.—George Little, New York City. April 8, 1867.

952.—PROCESS FOR MANUFACTURING ICE.—Thaddeus S. C. Lowe, New York City. March 30, 1867.

1,000.—ARTIFICIAL STONE FOR GRINDING, WHETTING, OR POLISHING PURPOSES, AND A PROCESS FOR PRODUCING THE SAME.—Geo. E. Van Derburgh, New York City. April 3, 1867.

1,028.—STEAM GENERATOR.—Mitchel Safety Steam Generator Company, Albany, N. Y. April 5, 1867.

1,044.—MODE OF EMBALMING.—Geo. W. Scollay, St. Louis, Mo., April 6, 1867.

1,068.—MACHINERY FOR PICKING AND GINNING COTTON.—Enoch Osgood, Boston, Mass. April 10, 1867.

1,078.—BRICK MACHINE.—Richard A. Douglas, Chicago, Ill. April 11, 1867.

1,069.—BREECH-LOADING FIRE-ARMS.—Henry H. Wolcott, Yonkers, N. Y. April 10, 1867.

1,077.—MODE OF AND APPARATUS FOR MULTIPLYING POWER, ESPECIALLY APPLICABLE TO HOISTING OR LIFTING MACHINERY.—Henry J. Griswold, Boston, Mass. April 11, 1867.

864.—MACHINERY FOR CUTTING CHANNELS IN STONE, ETC.—George J. Wardwell, Rutland, Vt. March 25, 1867.

866.—BREECH-LOADING FIRE-ARMS AND CARTRIDGES.—Loughlin Conroy and Tristram D. Vanderveer, New York City. March 25, 1867.

871.—STEAM AND VACUUM GAGE.—Emmett Quinn, Washington, D. C. March 26, 1867.

876.—SCREWS.—Valentine Fogerty, Boston, Mass. March 26, 1867.

882.—VALVE GEAR OF STEAM ENGINES.—William Wright, New York City March 26, 1867.

883.—LOOMS.—Erastus B. Bigelow, Boston, Mass. March 26, 1867.

894.—MACHINE FOR PAINTING METALLIC SURFACES, ETC.—Henry Fassmann, New Orleans, La. March 27, 1867.

EXTENSION NOTICES.

Charles Watt, of Putney, England, and Hugh Burgess, of Royer's Ford, Pa., having petitioned for the extension of a patent granted to them the 18th day of July, 1854, and antedated the 19th day of August, 1853, reissued the 5th day of October, 1858, and again reissued in two divisions the 7th day of April, 1863, for an improvement in process of treating wood and other vegetable substances in the manufacture of paper pulp, for seven years from the expiration of said patent, which takes place on the 19th day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 5th day of August next.

Henry Ritchie, of Newark, N. J., having petitioned for the extension of a patent granted to him the 23d day of August, 1853, for an improvement in padlocks, for seven years from the expiration of said patent, which takes place on the 23d day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 5th day of August next.

Arshal H. McKinley, of Higginsport, Ohio, having petitioned for the extension of a patent granted to him the 16th day of August, 1853, for an improvement in socket for auger handles and braces for seven years from the expiration of said patent, which takes place on the 16th day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of July next.

NEW PUBLICATIONS.

THE ART OF PERFUMERY. By G. W. Septimus Piesse. Philadelphia: Lindsay & Blakiston.

This book gives the methods of obtaining the odors of plants, and instructions for the manufacture of perfumes, cosmetics, etc., upon which subjects it is quite full and apparently complete. It is illustrated with numerous engravings and is neatly published.

THE ART OF MANUFACTURING SOAP AND CANDLES, Embracing Hard, Soft, and Toilet Soaps, the Modes of Detecting Frauds, etc., etc. By Adolph Ott. Philadelphia: Lindsay & Blakiston.

This is likely to be a manual for the perfumer and fancy soap manufacturer as it gives full accounts of the different processes for making their products.

MAP OF GILPIN COUNTY, Embracing the Central Gold Region of Colorado.

This map was drawn from surveys made last summer by Messrs. Chas. W. Morse and Geo. H. Hill, of Central City, Colorado. It is drawn on a scale of 1,500 feet to the inch and shows the mountains, gulches, cañons, streams roads, and quartz mills, giving the names of the companies to whom they belong; it also gives many of the most prominent lodes. The labor and expense of making accurate surveys in this rough region is great, and three months were devoted to its accomplishment. Only 200 copies have been published, mainly for subscribers. The map must be of advantage to capitalists who have invested in mines in this region, and also to miners either there or contemplating locating in that region. The price of this map is $25 per copy, to be obtained of Gaylord Watson, No. 16 Beekman street, N. Y., and Rufus Blanchard, Chicago, Ill.

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A PERFECT SUCCESS.—POWELL'S Patent Sleeve Supporter for Ladies' and Gentlemen's wear, sent by mail for 35 cents per pair. Illustrated in Scientific American, May 18, 1867. Agents wanted. Address THOS. POWELL, Milroy, Ind.

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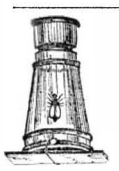

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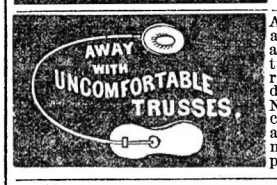

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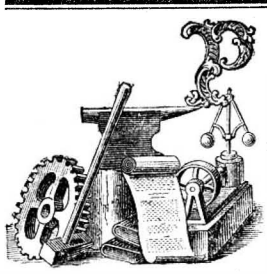

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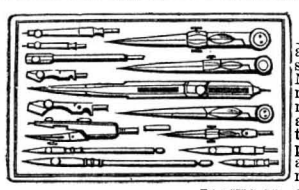

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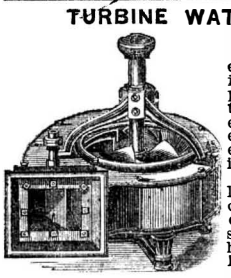

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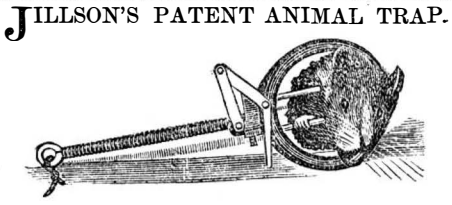

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